Antimicrobial Resistance: Global, National and Regional

Bart Currie

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World Health Day 2012

Good health adds life to years

Ageing and health - to which each and every one of us can relate - was the theme of World Health Day 2012. Using the slogan "Good health adds life to years", campaign activities and materials focused on how good health throughout life can help older men and women lead full and productive lives and be a resource for their families and communities.

World Health Day 2011

Antimicrobial resistance: no action today no cure tomorrow

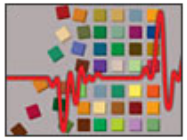
We live in an era of medical breakthroughs with new wonder drugs available to treat conditions that a few decades ago, or even a few years ago in the case of HIV/AIDS, would have proved fatal. For World Health Day 2011, WHO will launch a worldwide campaign to safeguard these medicines for future generations. Antimicrobial resistance and its global spread threaten the continued effectiveness of many medicines used today to treat the sick, while at the same time it risks jeopardizing important advances being made against major infectious killers.

World Health Day 2010

Urbanization and health

World Health Day 2010 focused on urbanization and health. With the campaign "1000 cities - 1000 lives", events were organized worldwide calling on cities to open up streets for health activities. Stories of urban health champions were gathered to illustrate what people are doing to improve health in their cities.

World Health Day 2009



Save lives. Make hospitals safe in emergencies

World Health Day 2009 focuses on the resilience and safety of health facilities and the health workers who treat those affected by emergencies. Events around the world will highlight successes, advocate for safe facility design and construction, and build momentum for widespread emergency preparedness.

World Health Day 2008

Protecting health from climate change

In 2008, World Health Day focused on the need to protect health from the adverse effects of climate change. The health impacts of climate change are already evident in different ways. These impacts will be disproportionately greater in vulnerable populations, which include the very young, elderly, medically infirm, poor and isolated populations.

World Health Day

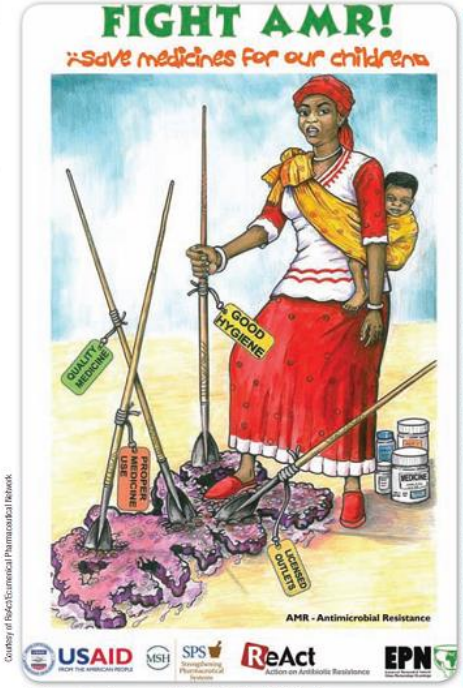
World Health Day – 7 April 2011

Antimicrobial resistance: no action today, no cure tomorrow

Antimicrobial resistance is not a new problem but one that is becoming more dangerous; urgent and consolidated efforts are needed to avoid regressing to the pre-antibiotic era.

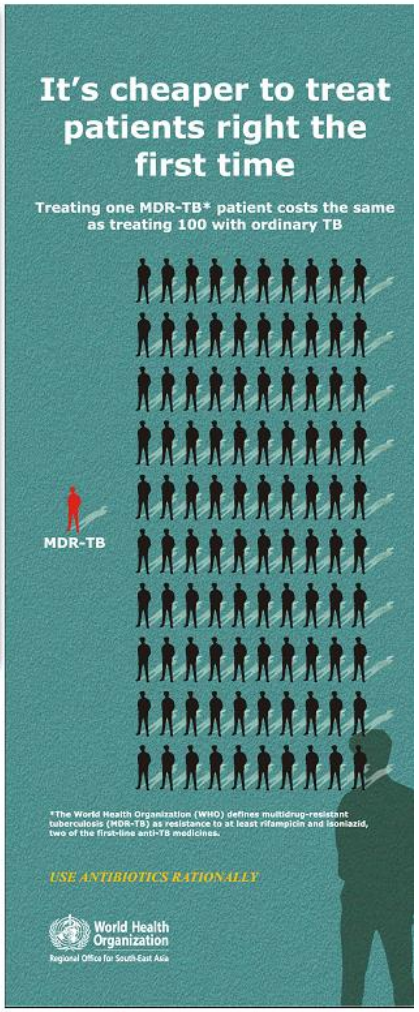
On World Health Day 2011, WHO will introduce a six-point policy package to combat the spread of antimicrobial resistance.

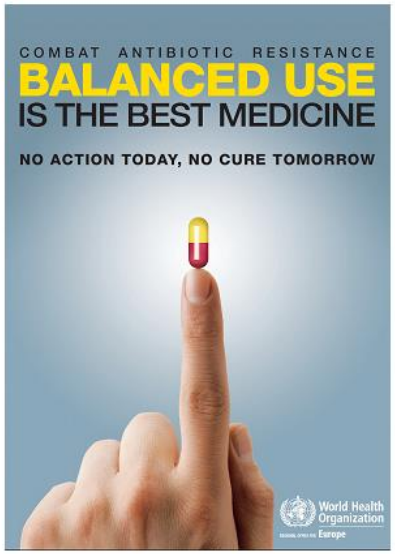
World Health Day 2011 brochure
pdf, 777kb



Courtesy of ReAct/Ecumenical Pharmaceutical Network

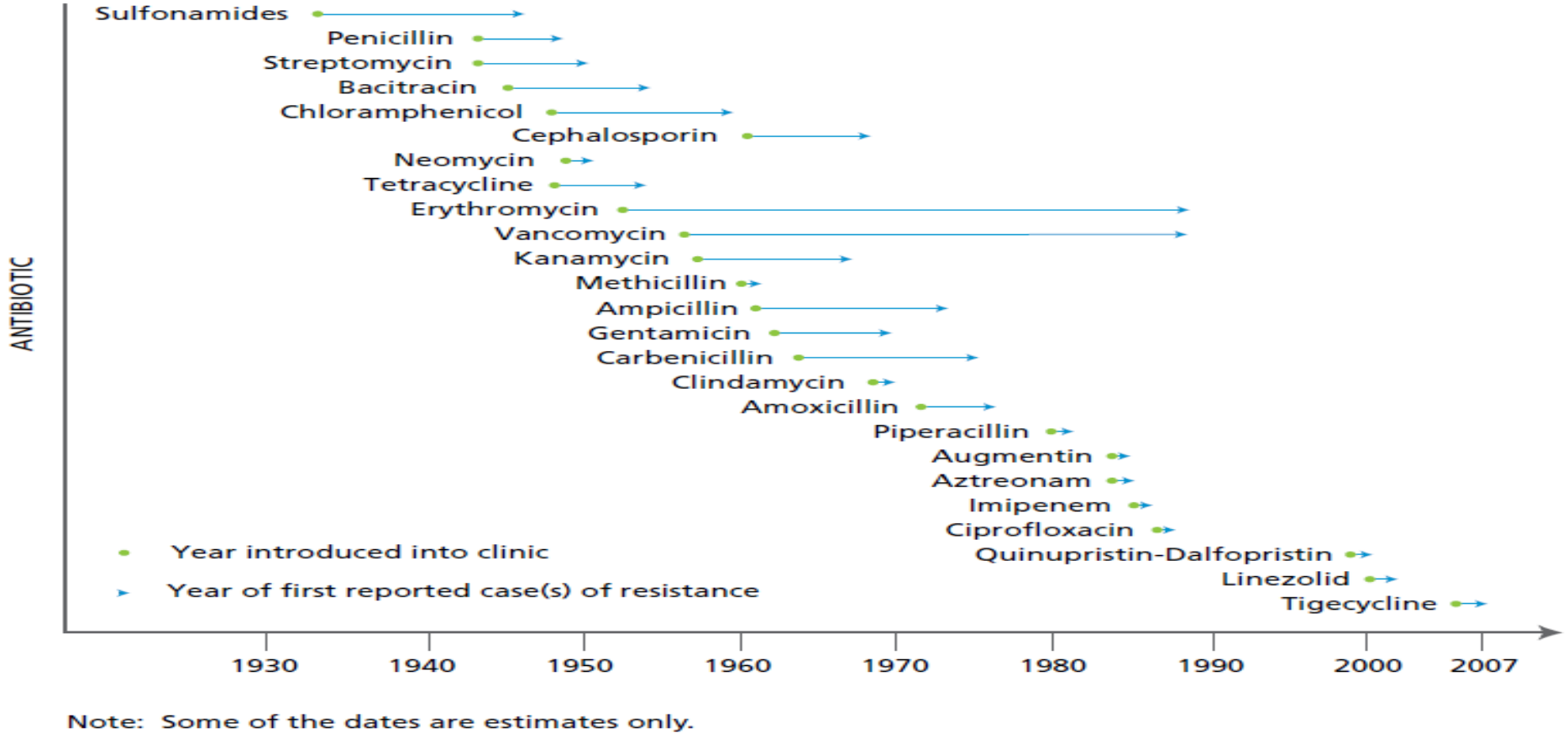
Campaign poster to raise awareness of the global threat of antimicrobial resistance





Emergence of antibiotic resistance

Antibiotic resistance threatens ability to control infection



Note: Some of the dates are estimates only.

Emergence of antibiotic resistance

Antibiotic resistance threatens ability to control infection
Which is critical to maintain medical advances

- Neonatal care
- Transplantation
- Chemotherapy for malignancy
- Immunosuppression
- Safe surgery
- Safe obstetric care
- Intensive care interventions

Emergence of antibiotic resistance

Antibiotic resistance threatens ability to control infection
Which is critical to maintain medical advances

THE SUNDAY AGE JUNE 9, 2013 3

NEWS

Australia running out of time to combat the rise of the superbugs

JILL STARK

Australia urgently needs a national centre to manage the threat of deadly superbugs, and must start screening all imported meat and seafood to prevent their spread, a Senate inquiry has recommended.

Tighter monitoring of the use of antibiotics in animals bred for food should also be introduced, along with national standards for hospital infection control.

The federal inquiry, instigated by Greens senator and former GP Richard Di Natale, was set up in response to an alarming increase in antibiotic resistance and rising rates of superbug infections.

Doctors told the inquiry that while the bugs had once affected mostly people with weakened immune systems, such as cancer or transplant patients, healthy Australians were increasingly contracting superbugs through routine medical procedures due to the proliferation of antibiotic-resistant bacteria.

The widespread use of antibiotics in intensive farming, particularly in meat, poultry and seafood imported from countries such as China and Vietnam, has been pinpointed as one likely factor fuelling the trend.

"This is a problem that the medical community and infectious diseases and public health specialists have known about for over a decade but there just hasn't been an adequate response from successive governments. But we must act because ... the rise of superbugs has the potential to take us to a pre-industrial age era in medicine where we just don't have antibiotics," Dr Di Natale said.

The inquiry's findings, released on Friday, have been welcomed by infectious diseases experts who say there will be dire health consequences if the government does not adopt them.

"We have time to fix this but we don't have much time. We have about five years to get this right before it's really going to be a major problem," said Professor Lindsay Grayson, director of infectious disease at Austin Health.

"If the superbug situation gets much further out of control then w won't be able to do transplantation lot of chemotherapy for cancer will need to stop, neonatal intensive ca units won't be able to look after kid any more because all of those fanta advances in human healthcare have only been made possible because we've been able to treat the inevitable routine infections that occur with antibiotics. If now, instead of your infection being one of the easy-to-treat bugs it's a superbug that doesn't respond to antibiotics, it's suddenly very difficult."

Improved surveillance and report-

Professor Grayson said was vital in preventing the spread of deadly bugs, and had proved successful with national hand hygiene protocols.

"That would mean that it doesn't matter if you're in a hospital in Queensland or Victoria, the standards will be the same. The way you put in an IV drip and the way urinary catheters are inserted should be the same an effective way of minimising the spread of infection, he added.

"We take all these sick people and put six of them in a room together and then we're surprised when they spread diseases to each other. We need a system of one bum per toilet because a lot of these superbugs are actually spread from person to person because the toilet becomes contaminated. In the

The full story...

Enter Keywords Here SEARC

Chief medical officer calls on govt and science communities to combat antibiotic resistance

Tony Eastley reported this story on Wednesday, July 10, 2013 08:12:00

Superbug discovery triggers new health alarm

BY DAN HARRISON

Researchers have confirmed long-held fears that a drug-resistant bug that is increasingly common in Australia can spread from person to person.

In a finding that could carry major implications for how hospitals control infections, British researchers have provided the first proof the debilitating bug, *Mycobacterium abscessus*, can be transmitted between patients.

The bug, which accelerates decline in lung function and can prevent safe lung transplantation, has become increasingly prevalent in Australia over the past decade, a previous study found. It must be treated with an extended course of a poorly tolerated combination of antibiot-

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fections.

The study authors say their findings carry major implications for how hospitals care for patients and raise questions about the adequacy of current infection control measures.

The researchers conducted DNA analysis of samples collected from 31 patients at a cystic fibrosis centre in Britain and concluded the bug had frequently been transmitted between patients, despite infection-control measures. Previously, it had been thought people caught the bug from their environment. While experts had been concerned about the possibility of the bug spreading between people, the study provides the first proof.

Researchers were unable to identify exactly how it had been transmitted, but suggested it may have spread through contaminated clothing or bedding or through airborne water droplets.

England's chief medical officer, Dame Sally Davies, recently called for worldwide action to combat antibiotic-resistant bacteria, saying superbugs posed a "catastrophic threat" to human health that should be likened to terrorism.

Greens senator Richard Di Natale, a medical doctor who instigated the Senate inquiry, said the emergence of superbugs was "one of the great health challenges of this decade".

"We only have a very narrow window to take action to start turning the problem around.

If we don't, we face the prospect of a world without antibiotics, where people will die of simple infections," he said.

He described evidence to the inquiry as "alarming" and said the government needed to make tackling the problem a priority.

The federal government has set up a committee, comprising public servants, the chief medical officer and the chief veterinary officer to look at the problem.

Austin Hospital head of infectious diseases Professor Lindsay Grayson told the inquiry if authorities did not move to contain existing superbugs and prevent new ones emerging over the next three to five years, infections would increase dramatically.

Superbugs Potential catastrophe for human health

Surgery could soon become deadly

Julia Medew
Health Editor

Superbugs could soon make routine surgical procedures deadly for healthy people if authorities do not start introducing measures to tackle them, doctors say.

The warning comes as England's chief medical officer, Dame Sally Davies, called for worldwide action to combat antibiotic-resistant bacteria that she said posed a "catastrophic threat" to human health that should be likened to terrorism.

In submissions to an Australian Senate inquiry into the problem, microbiologists and infectious disease experts called for better cleaning of hospitals and more testing of animals and food.

Head of infectious diseases at the Austin Hospital Professor Lindsay Grayson said if authorities did not move to contain existing superbugs and prevent the emergence of new ones over the next three to five years, infections would increase dramatically.

While superbugs were already a routine daily feature of healthcare for many, Professor Grayson said if nothing was done, they would become the norm in coming years, especially for immunocompromised patients such as transplant recipients, sick infants and those being treated for cancer.

Although it is currently unusual for healthy people to fall ill with superbug infections, he said urinary tract infections were increasingly becoming difficult to treat. Five years ago, he said, about 5 per cent of such infections among Victorian women were resistant to many antibiotics – now it was more than 20 per cent.

"[Urinary tract] infections were something previously GPs could easily manage," he said. "Now we're increasingly seeing them resistant to all the antibiotic tablets available and we're having to use intravenous antibiotics ... Even then, we're very restricted in terms of which ones will work."

Proliferation of the l
also make routine surge
larly bowel surgery,
deadly for people.

The Australian Sc
Microbiologists also
more funding to develo
biotics, saying the globa
ceutical industry had "d
ball" in favour of mak
more profitable drugs.

Greens senator Ri
Natale – a medical d
instigated the inquiry – s
hopeful a new governme
committee, with senio
crats, the chief medical
chief veterinary officer c
help relieve the problem.

Daily Mail AUSTRALIA

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Nevada woman killed by superbug resistant to EVERY antibiotic in the US

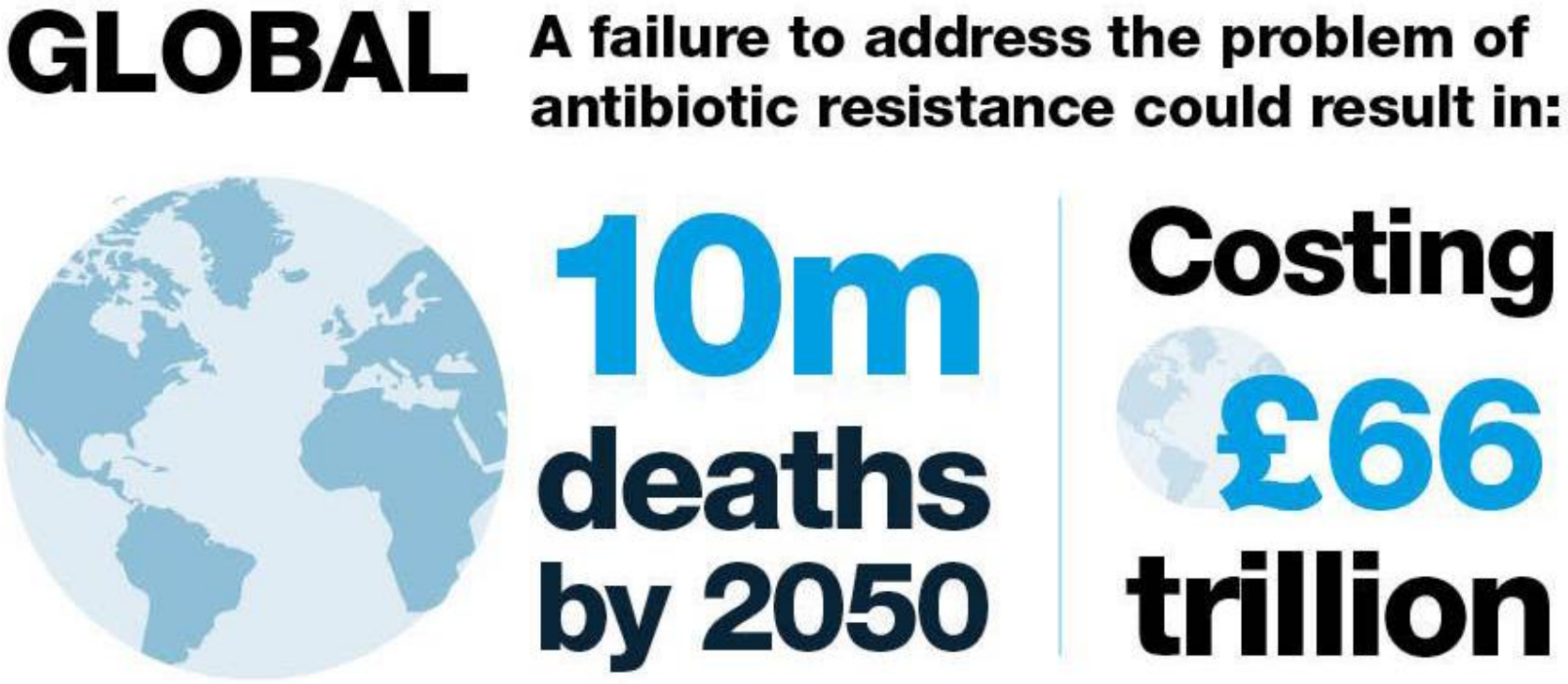
England's chief medical officer warns of 'antibiotic apocalypse'

Thursday 19 May 2016 09.01 AEST

The "antibiotic apocalypse" may already be upon us according to Dame Sally Davies, chief medical officer for England, with estimates of around 50,000 deaths per year recently in Europe and the US, due to antibiotic resistant infections, and far greater numbers worldwide.

She has described the threatened loss of antibiotics to the world as on a par with terrorism and climate change.

“The biggest threat facing human health?”



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“The biggest threat facing human health”

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Increase in antibiotic-resistant infections linked to government corruption, study finds

AM by Samantha Donovan

Updated 19 Mar 2015, 2:04pm

The increase in antibiotic-resistant infections, labelled an impending health crisis by the World Health Organisation, has been linked to a country's level of government corruption in new research from the Australian National University.

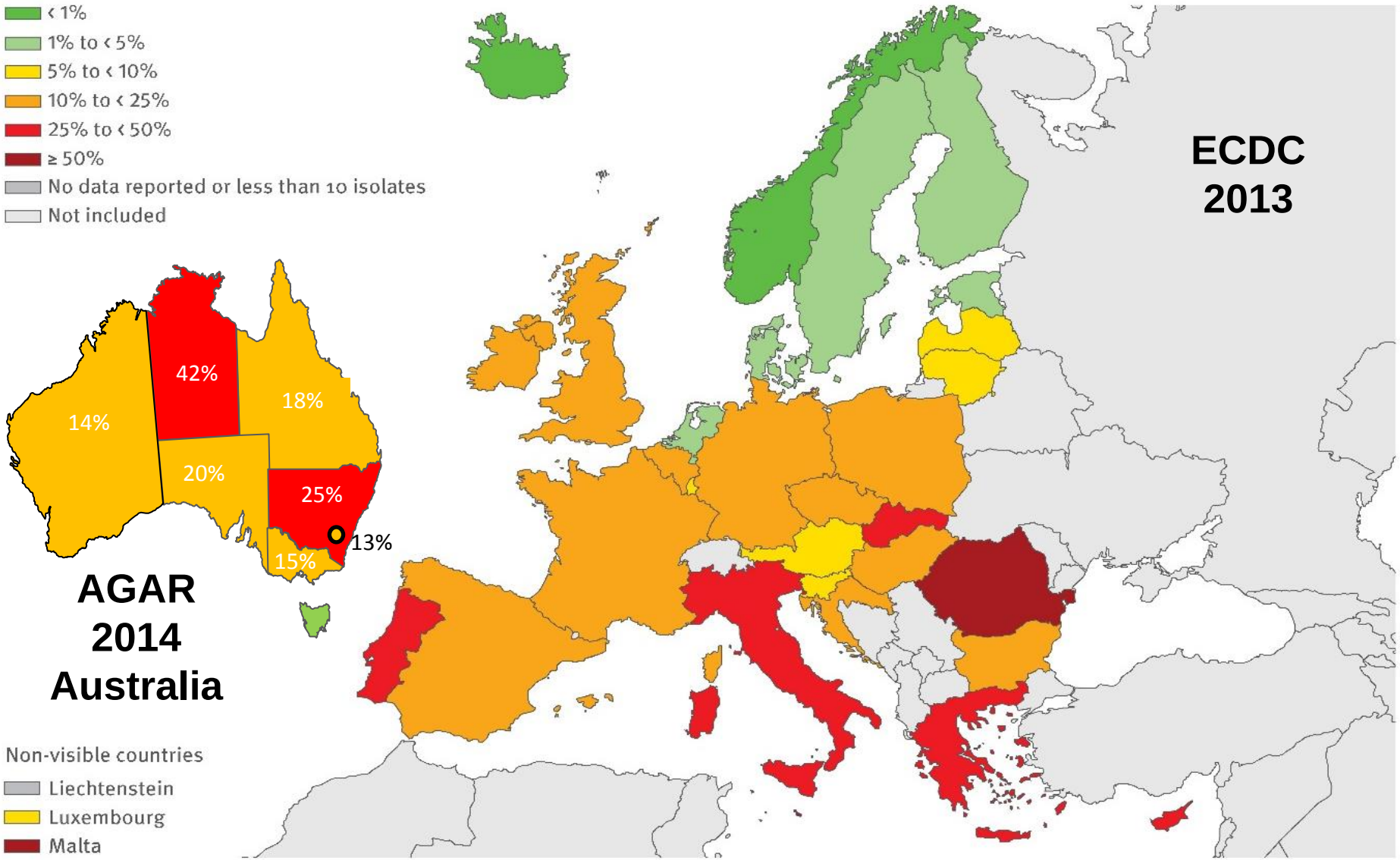
The over-prescription of the drugs is often cited as the major cause of the phenomenon, but new research from ANU has found a surprising link between the level of corruption in a country and the extent of its population's antibiotic resistance.

"Countries with higher levels of corruption have processes of government that aren't as rigorously

PHOTO: Antibiotic resistance has been described as the biggest threat facing human health. (iStockPhoto/Jose Manuel Gelpi Diaz)

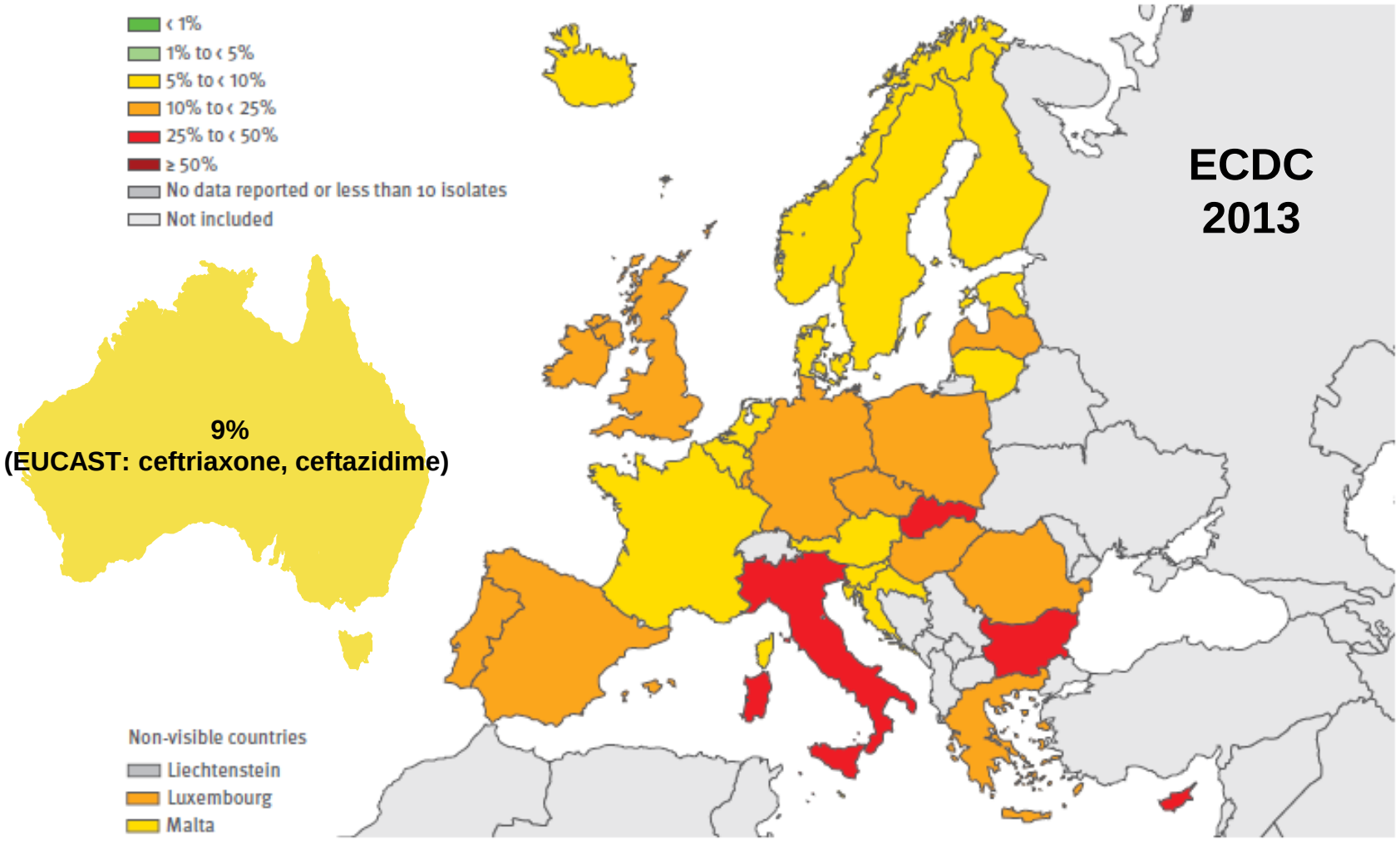
RELATED STORY: Scientists discover new antibiotic for first

Invasive *Staphylococcus aureus* - %MRSA

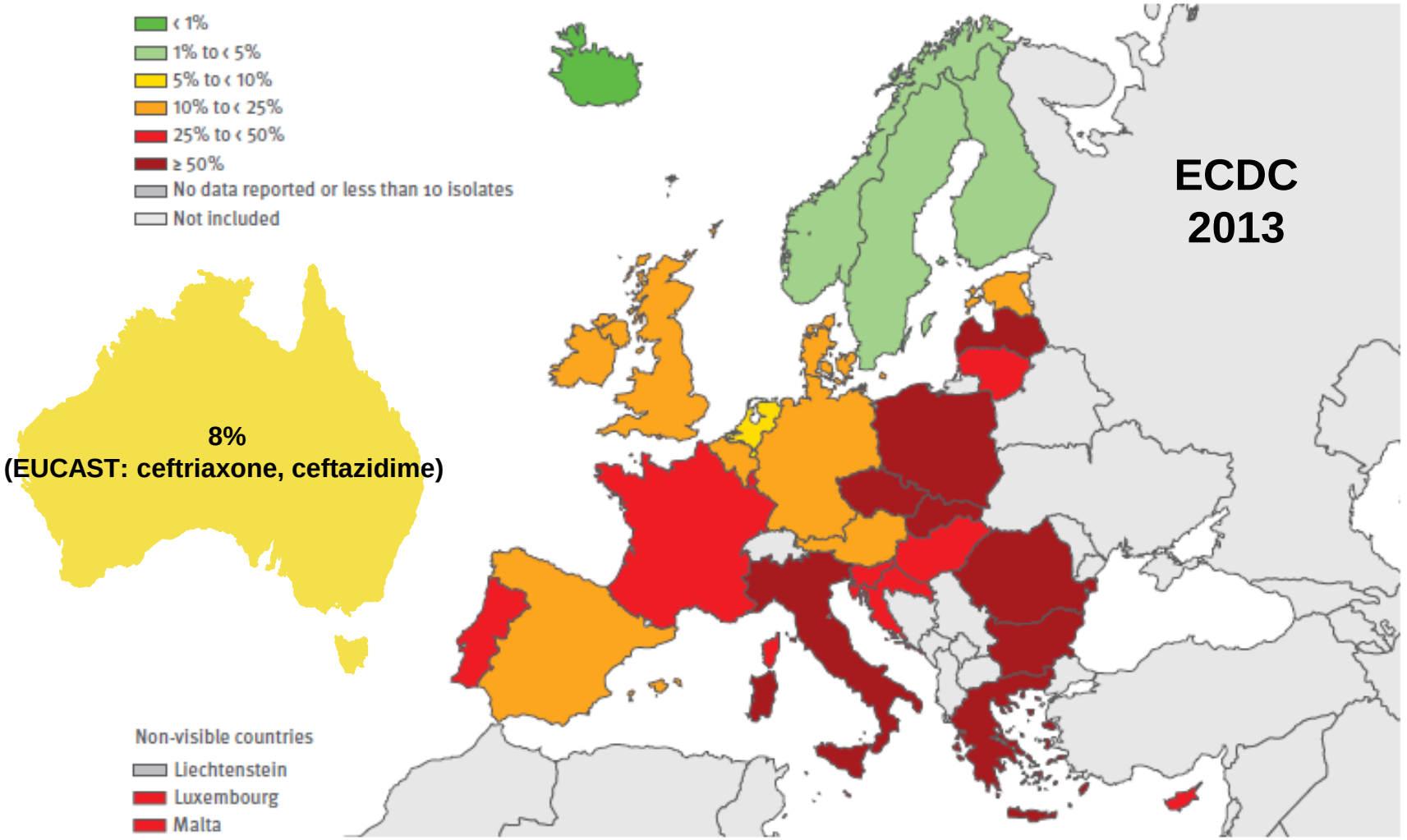


Source: European Centre for Disease Prevention and Control. Antimicrobial resistance surveillance in Europe 2013. Stockholm: ECDC, 2014

Invasive *E. coli* - % resistant to ceftriaxone

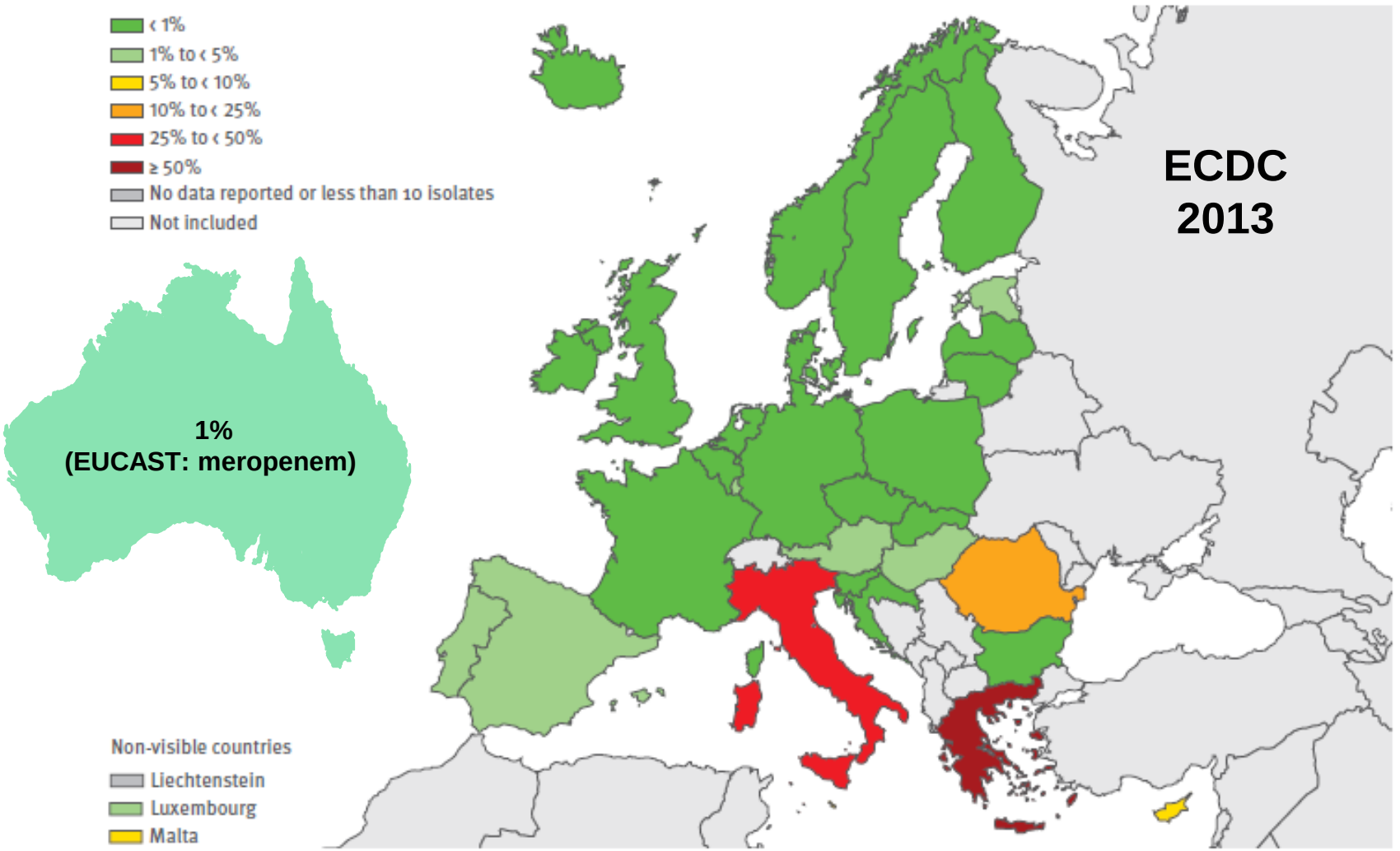


Invasive *Klebsiella pn* - % resistant to ceftriaxone

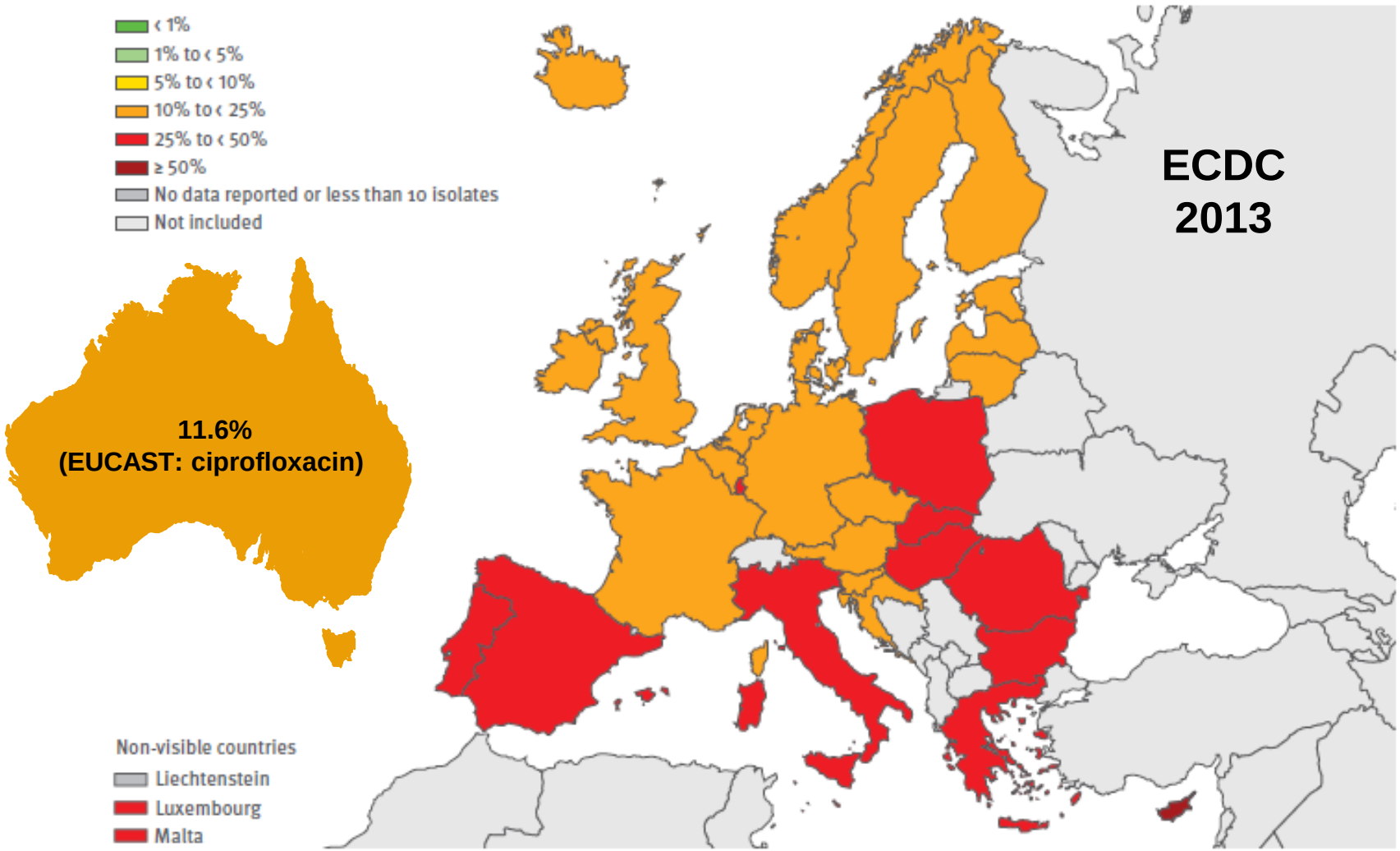


Invasive *E. coli* - % resistant to meropenem

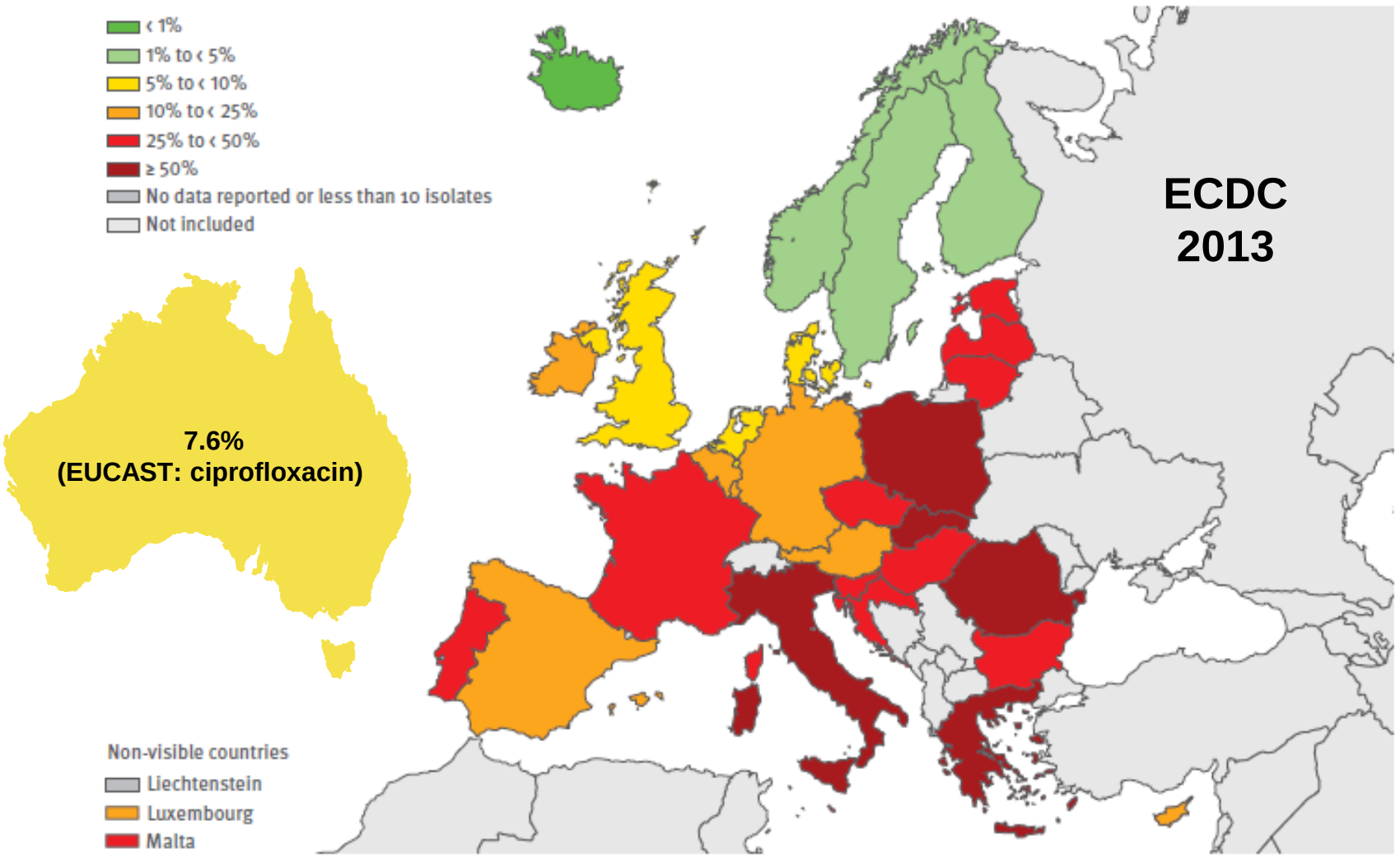
Invasive *Klebsiella pn* - % resistant to meropenem



Invasive *E. coli* - % resistant to ciprofloxacin



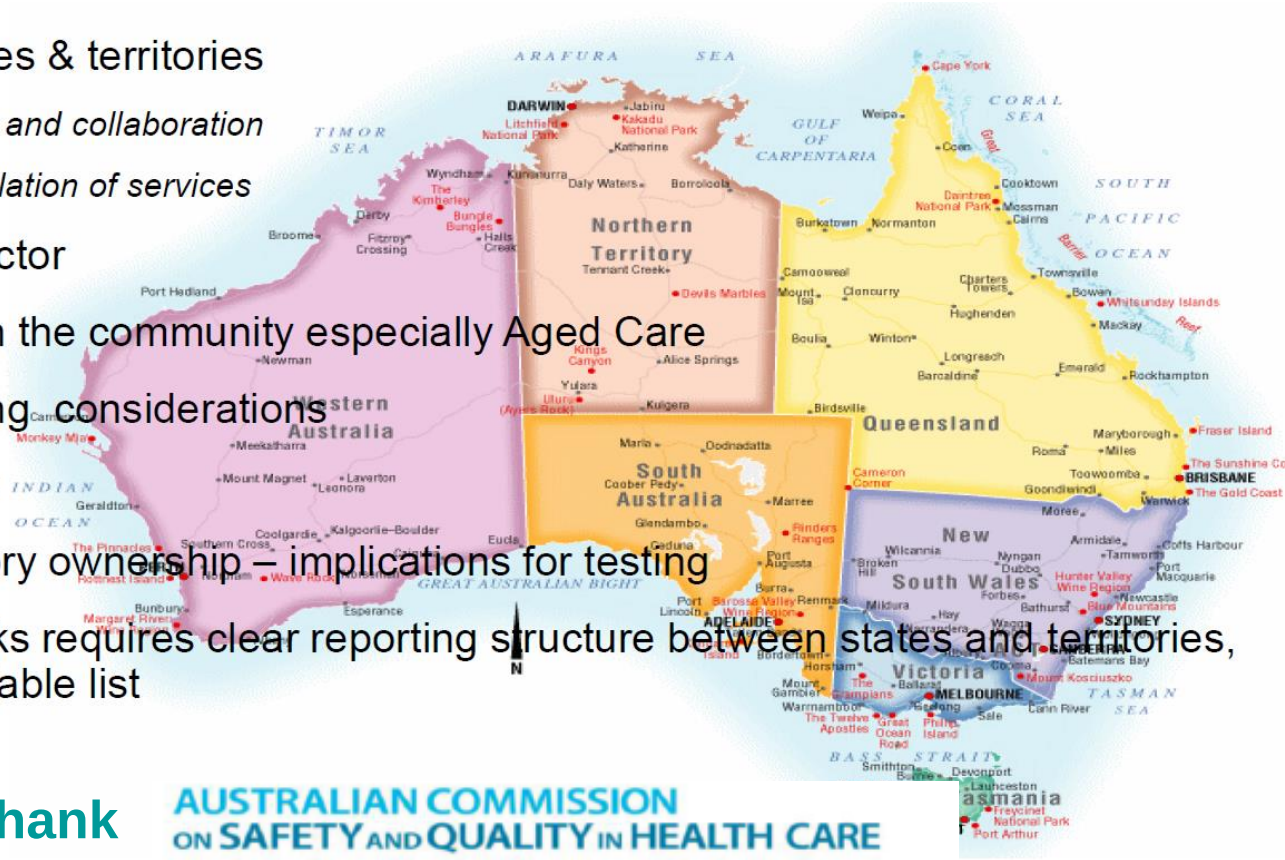
Invasive *Klebsiella pn* - % resistant to ciprofloxacin



Europe is way ahead of Australia in AMR response

Limitations to AMR Response in Australia

- Impact of federation of states & territories
  - *decisions are by consensus and collaboration*
  - *plurality of funding and regulation of services*
- 44% hospitals in private sector
- AMR and AU also occurs in the community especially Aged Care
- Data collection and reporting considerations
- Since 2011, still some silos
- Increase in private laboratory ownership – implications for testing
- Response to AMR outbreaks requires clear reporting structure between states and territories, esp organisms not on notifiable list



Prof Marilyn Cruickshank

AUSTRALIAN COMMISSION ON SAFETY AND QUALITY IN HEALTH CARE

29 June 2017 Melbourne

Lancet Infect Dis 2016

Published Online
October 14, 2016

Import and spread of extended-spectrum β-lactamase-producing Enterobacteriaceae by international travellers (COMBAT study): a prospective, multicentre cohort study

Maris S Arcilla, Jarne M van Hattem*, Manon R Haverkate, Martin C J Bootsma, Perry J J van Genderen, Abraham Goorhuis, Martin P Grobusch, Astrid M Oude Lashof, Nicky Molhoek, Constance Schultsz, Ellen E Stobberingh, Henri A Verbrugh, Menno D de Jong, Damian C Melles, John Penders*

2001 Dutch travellers & 215 non-travel household members

Faecal samples after return showed:

- 34·3% of travellers had acquired ESBL during international travel
  - 75·1% of those who travelled to southern Asia
- Median duration of colonisation after travel was 30 days
  - 11·3% remained colonised at 12 months
- The probability of transmitting ESBL to a household member was 12%

Travellers to areas with a high risk of ESBL-E acquisition should be viewed as potential carriers of ESBL for up to 12 months after return

Case reports MJA 202 (5) · 16 March 2015

Local acquisition and nosocomial transmission of *Klebsiella pneumoniae* harbouring the *bla*$_{NDM-1}$ gene in Australia

Alex Y C Tai

Clinical focus

Facing the challenge of multidrug-resistant gram-negative bacilli in Australia

Patrick Harris

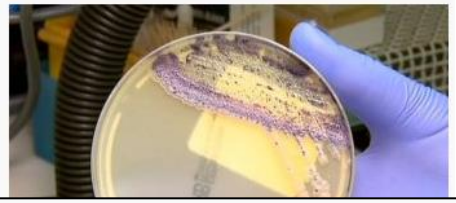
A key risk factor for infection with MDR GNB is travel to countries with high rates of resistance

Minimising the risk of MDR GNB becoming firmly established in Australian health care facilities will require a multifaceted approach

Hospitals warned over new antibiotic-resistant superbug believed responsible for two deaths in Victoria in last three years

Updated yesterday at 5:49pm

Health officials are warning about a "particularly concerning" antibiotic-resistant superbug they believe has been responsible for two deaths in Victoria in the last three years.



Hospitals have been advised to strictly enforce current standards on managing antibiotic-resistant

The new bug is a strain of CRE (carbapenem-resistant enterobacteriaceae) known as KPC and is resistant to some of the most powerful antibiotics.

Fifty-seven people have been infected or colonised by the bacteria in Victoria since 2012, the majority of which were in a cluster at St Vincent's Hospital.

Eighteen of those affected have died and health officials believe KPC was responsible for at least two of those deaths, Dr Finn Romanes, the state's acting chief health officer said.

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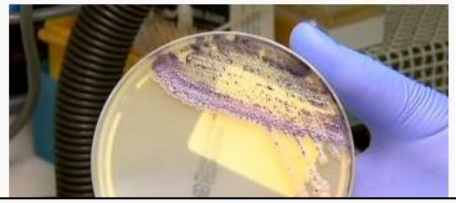

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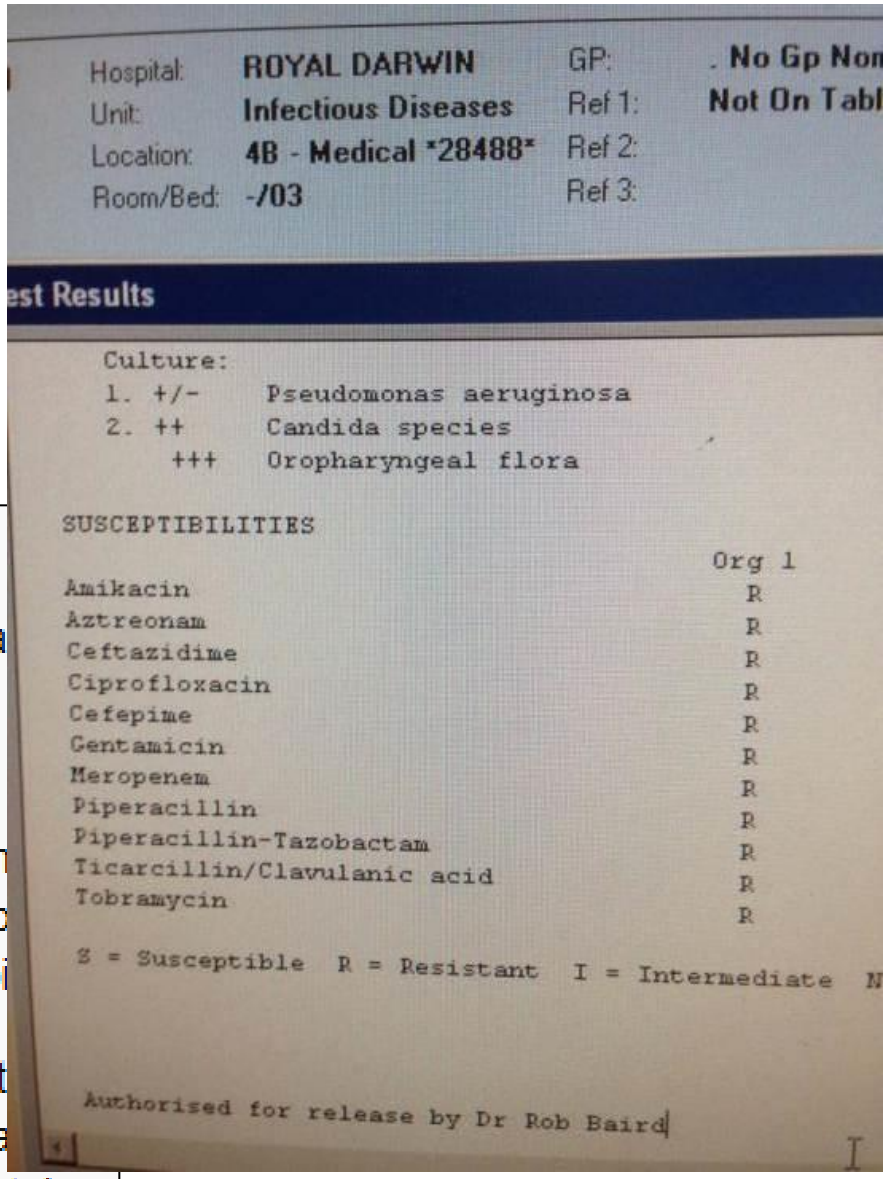


Hospital: ROYAL DARWIN
Unit: Infectious Diseases
Location: 4B - Medical *28488*
Room/Bed: -/03
GP: . No Gp Nom
Ref 1: Not On Tabl
Ref 2:
Ref 3:

est Results

Culture:
1. +/- Pseudomonas aeruginosa
2. ++ Candida species
+++ Oropharyngeal flora

SUSCEPTIBILITIES

	Org 1
Amikacin	R
Aztreonam	R
Ceftazidime	R
Ciprofloxacin	R
Cefepime	R
Gentamicin	R
Meropenem	R
Piperacillin	R
Piperacillin-Tazobactam	R
Ticarcillin/Clavulanic acid	R
Tobramycin	R

S = Susceptible R = Resistant I = Intermediate N

Authorised for release by Dr Rob Baird

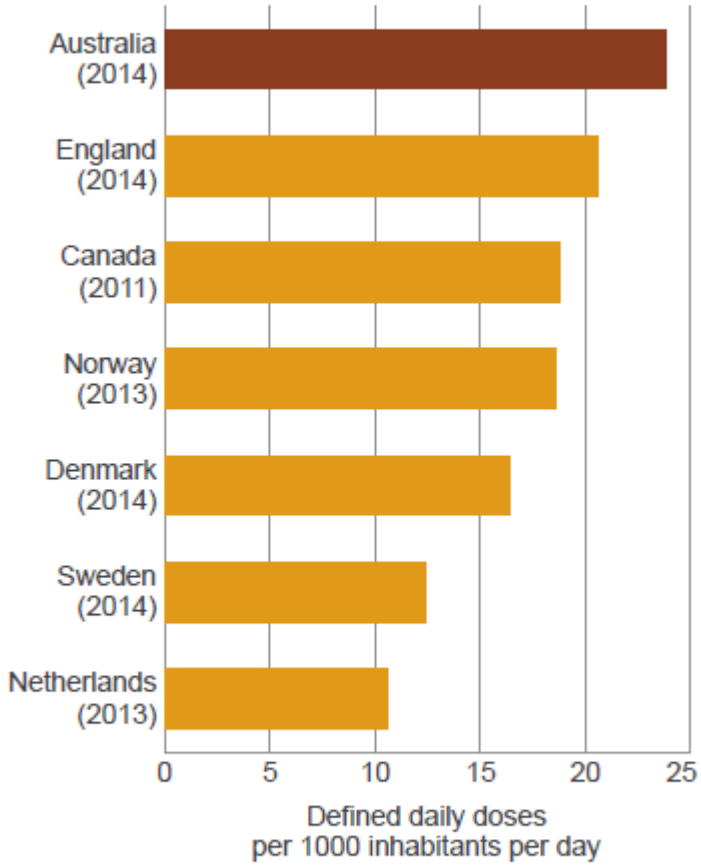
Multiresistant organisms post 2002 Bali bombings

- **35 patients with severe burns transferred to Royal Perth**
  - 19 Multi-resistant *Acinetobacter baumannii* (MRAB)
  - 15 Extended-spectrum B- lactamase producing Gm-negs (ESBL)
  - 9 Vancomycin-resistant enterococci (VRE)
  - 6 Multi-resistant *Pseudomonas aeruginosa* (MRPA - 2 fatal)
  - 3 MRSA
- **Transmission of MROs to 41 non-Bali pts in RPH**
  - 11 bacteremias
  - 4 deaths with MRPA

Heath C et al. Aust Infect Control 2003;8:43-54

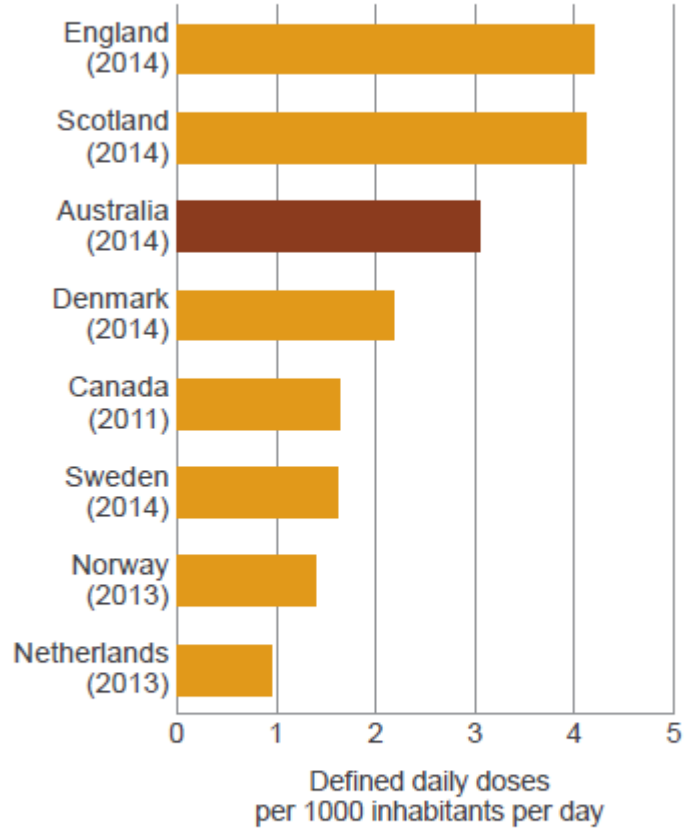
Antimicrobial use in Australia

Figure D Community antimicrobial use in Australia and other similar countries



Sources: Pharmaceutical Benefits Scheme (Australia); CIPARS (Canada); DANMAP (Denmark); ESPAUR (England); NethMAP (Netherlands); SWEDRES (Sweden)

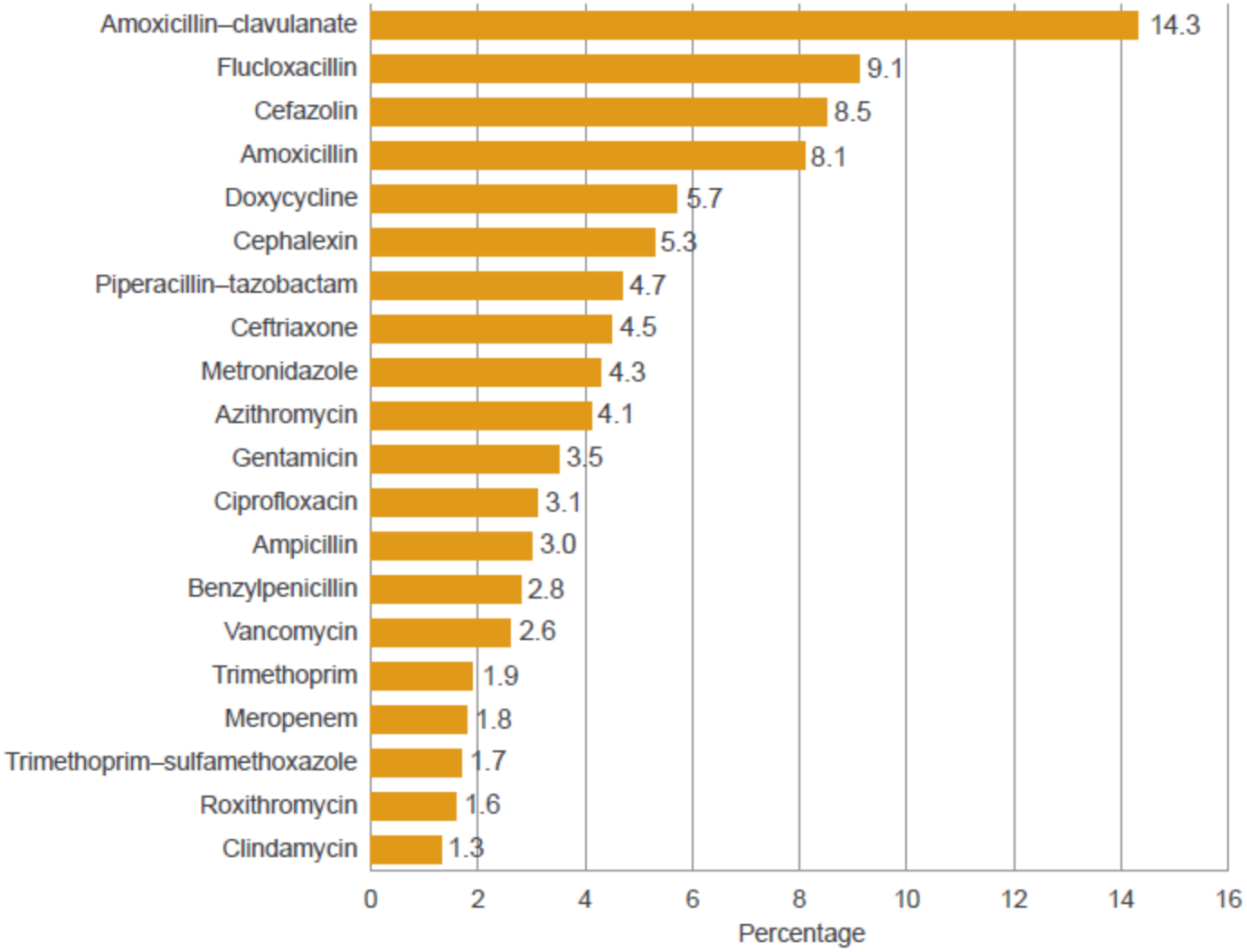
Figure C Antimicrobial use in Australian hospitals and other countries



Sources: National Antimicrobial Utilisation Surveillance Program (Australia); CIPARS (Canada); DANMAP (Denmark); ESPAUR (England); NethMAP (Netherlands); SAPG (Scotland); NORM (Norway); SWEDRES (Sweden)

Antimicrobial use in Australia

Figure 3.2 Top 20 antimicrobials used in Australian hospitals, 2014



MJA 207 (2) ▪ 17 July 2017

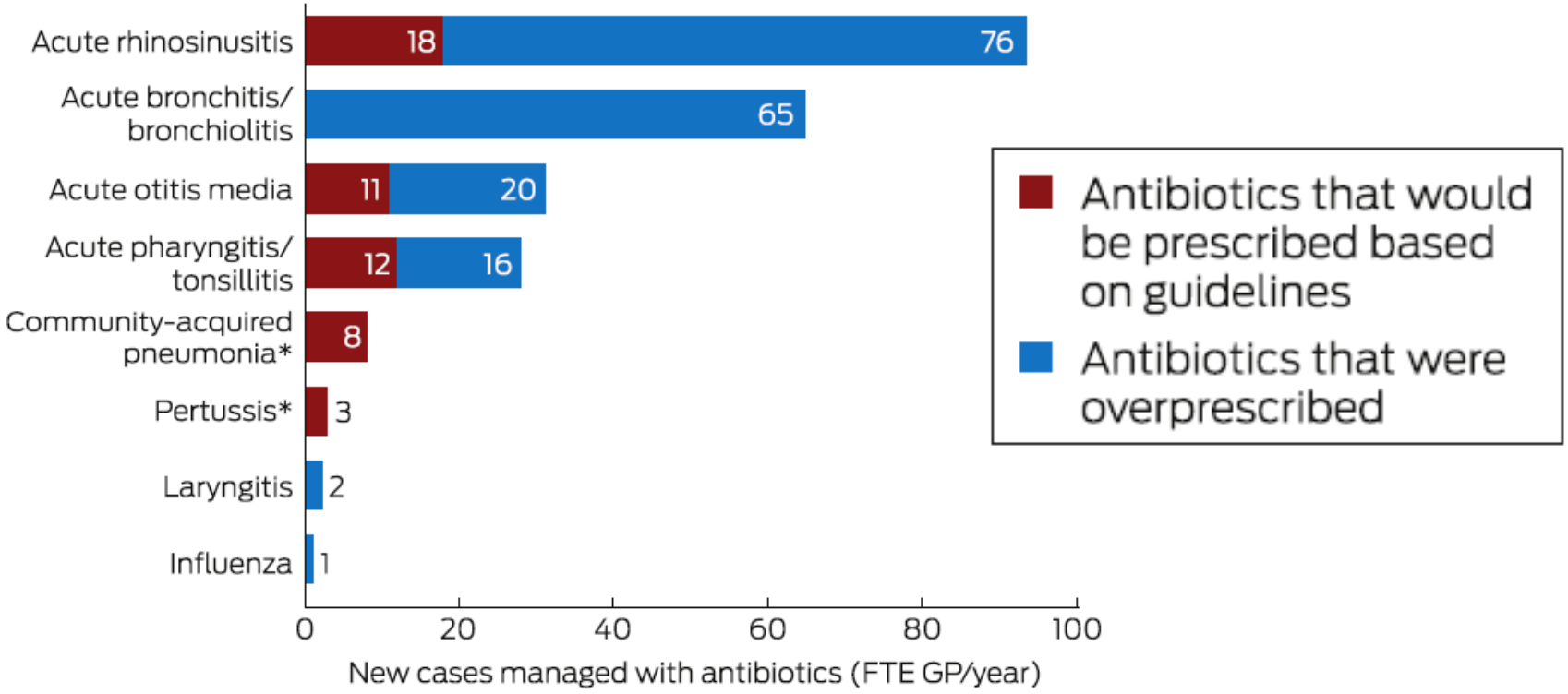
Research

Antibiotics for acute respiratory infections in general practice: comparison of prescribing rates with guideline recommendations

Amanda R McCullough[1], Allan J Pollack[2], Malene Plejdrup Hansen[3], Paul P Glasziou[1], David FM Looke[4], Helena C Britt[5], Christopher B Del Mar[6]

Conclusions: Antibiotics are prescribed for ARIs at rates 4–9 times as high as those recommended by *Therapeutic Guidelines*. Our data provide the basis for setting absolute targets for reducing antibiotic prescribing in Australian general practice.

Antibiotics for acute respiratory infections in general practice: comparison of prescribing rates with guideline recommendations



Editorial

MJA 207 (2) ▪ 17 July 2017

Can antibiotic prescribing for respiratory infections be reduced?

Martin Gulliford, Mark Ashworth

It must be — as an essential component of the response to the antimicrobial drug resistance problem

In Australia antibiotic consumption is among the highest of the OECD countries

The study reveals that acute respiratory infections account for more than half of all antibiotics prescribed in primary care, but fewer than one-quarter of prescriptions for antibiotics—and **possibly as few as 11%**—could be justified with reference to Australian prescribing guidelines

Current evidence suggests that antibiotic prescribing is not justified on safety grounds for most patients presenting with RTIs; **GPs can use existing guidelines to target patients who are at increased risk of complications because of severity of illness, age or comorbidity**

Antibiotic prescribing in primary care in England was 7.9% lower in 2015 than in the preceding year

Annals of Internal Medicine

EDITORIAL

Antibiotic Overuse: Clinicians Are the Solution

Barbara E. Jones, MD, MSc
Matthew H. Samore, MD
Salt Lake City VA Health System and University of Utah
Salt Lake City, Utah

• Vol. 166 No. 11 • 6 June 2017

BMJ 2017;358:j3418 doi: 10.1136/bmj.j3418 (Published 2017 July 26)

thebmj

ANALYSIS

The antibiotic course has had its day

With little evidence that failing to complete a prescribed antibiotic course contributes to antibiotic resistance, it's time for policy makers, educators, and doctors to drop this message, argue **Martin Llewelyn and colleagues**

Concern that giving too little antibiotic treatment could select for antibiotic resistance can be traced back to the dawn of the antibiotic era

Resistance can occur with inadequate antimicrobial dosing or with monotherapy for infections for which spontaneous resistant mutations arise on treatment, such as **tuberculosis, gonorrhoea, malaria and HIV – "professional pathogens"**

But for most forms of antibiotic resistance that currently threaten patients, selection of resistance in the bacteria being treated is of limited importance - ***Escherichia coli*** and the so called ESKAPE organisms (***Enterococcus faecium*****, *Staphylococcus aureus*****, *Klebsiella pneumoniae*****, Acinetobacter *spp*****, Pseudomonas *spp*****, Enterobacter *spp***), which are all found harmlessly in us, on us, or in our environment – "**opportunist pathogens**"

thebmj

ANALYSIS

The antibiotic course has had its day

With little evidence that failing to complete a prescribed antibiotic course contributes to antibiotic resistance, it's time for policy makers, educators, and doctors to drop this message, argue **Martin Llewelyn and colleagues**

For the opportunist pathogens for which antimicrobial resistance poses the greatest threat, no clinical trials have shown increased risk of resistance among patients taking shorter Tx

For these opportunist pathogens, **resistant strains are transmitted between asymptomatic carriers** rather than people with disease. Furthermore, many resistance conferring genes can pass easily between bacterial strains or species - methicillin resistance in *Staphylococcus aureus,* extended spectrum β-lactamase producing *Enterobacteriaceae* and carbapenemase in *Klebsiella pneumoniae*

For such organisms, **resistance selection occurs predominantly during antibiotic treatment of other infections** – eg cephalexin or amoxy/clav for UTI selects out C-MRSA

In many situations, stopping antibiotics sooner is a safe and effective way to reduce antibiotic overuse

Antibiotics
Opinion

Trust me on antibiotics, doctor - I'm a patient

Anne Perkins

Evidence that finishing the course may fuel bacterial resistance will test our relationship with experts - and perhaps begin the healing process

Anne Perkins is a Guardian columnist

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