



Antimicrobial Resistance: A big global and national worry

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World Health Day

World Health Day – 7 April 2011

Antimicrobial resistance: no action today, no cure tomorrow

COMBAT DRUG RESISTANCE

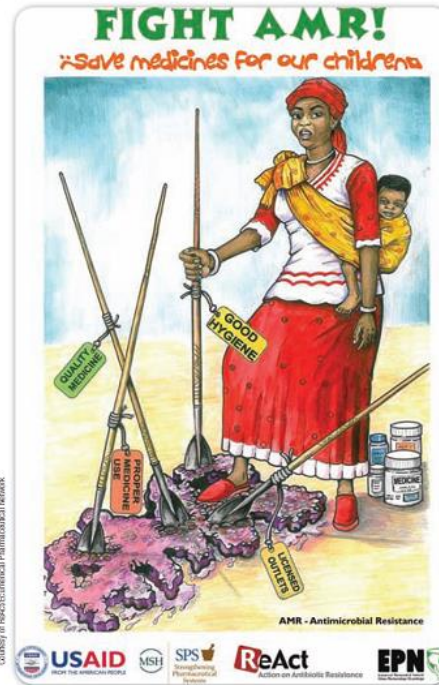
No action today,
no cure tomorrow



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.

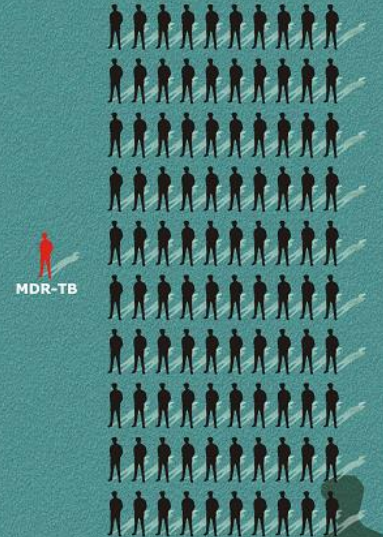
World Health Day 2011 brochure
pdf, 777kb



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

It's cheaper to treat patients right the first time

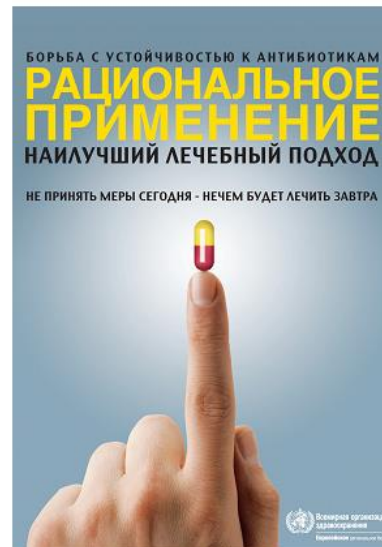
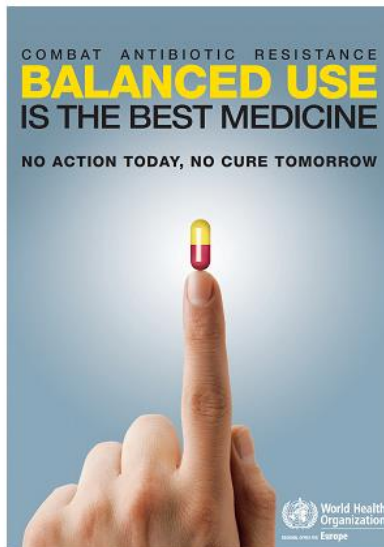
Treating one MDR-TB* patient costs the same as treating 100 with ordinary TB



*The World Health Organization (WHO) defines multidrug-resistant tuberculosis (MDR-TB) as resistance to at least rifampicin and isoniazid, two of the first-line anti-TB medicines.

USE ANTIBIOTICS RATIONALLY

World Health Organization
Regional Office for South-East Asia



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 Viet-

nam, 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 we won't be able to do transplantation lot of chemotherapy for cancer will need to stop, neonatal intensive care units won't be able to look after kid any more because all of those fanti-

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 burn per toilet because a lot of these superbugs are actually spread from person to person because the toilet becomes contaminated. In the

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 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 proves the first proof.

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".

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".

They 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 five to ten years, infections would increase dramatically.

The full story...

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

Tony Eastley reported this story on Wednesday, July 10, 2013 06:12:00

Enter Keywords Here SEARCH

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 bugs also make routine surgery, particularly bowel surgery, deadly for people.

The Australian Society of Microbiologists also called for more funding to develop antibiotics, saying the global pharmaceutical industry had "died" in favour of more profitable drugs.

Greens senator Richard Di Natale - a medical doctor who instigated the inquiry - said a new governance committee, with senior medical professionals, the chief medical officer and chief veterinary officer could help relieve the problem.

Daily Mail
AUSTRALIA

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



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



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?”

GLOBAL

A failure to address the problem of antibiotic resistance could result in:



10m
deaths
by 2050

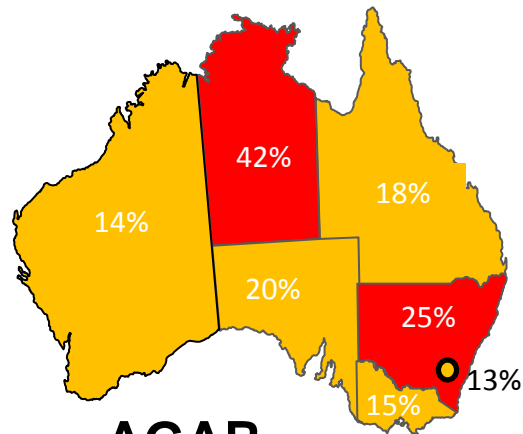
Costing
**£66**
trillion

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

Invasive *Staphylococcus aureus* - %MRSA



**ECDC
2013**

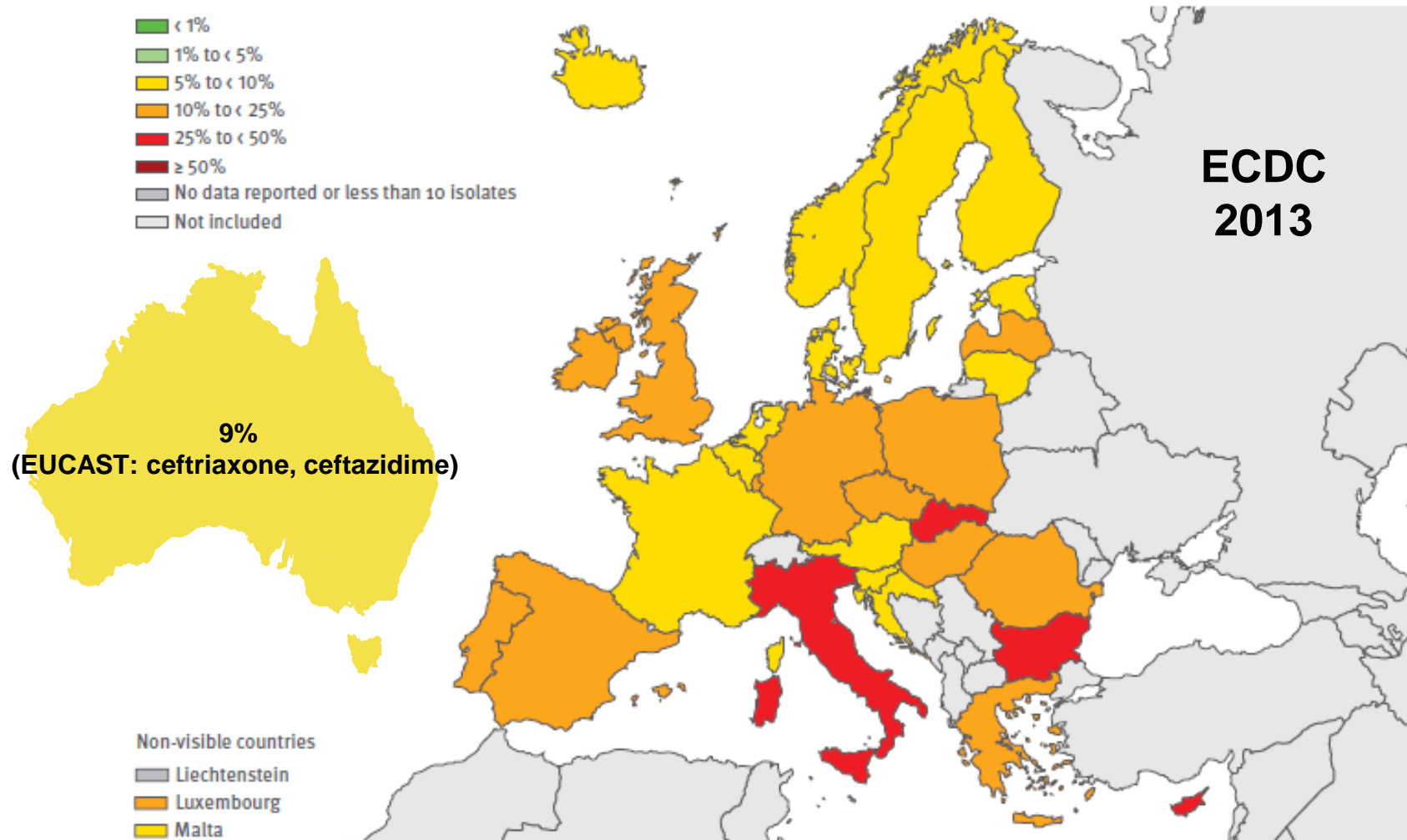


**AGAR
2014
Australia**

Non-visible countries



Invasive *E. coli* - % resistant to ceftriaxone



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

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

Case reports

Local acquisition
of *Klebsiella*
gene in Australia

Facing the
resistant

A key risk

Minimising the
in Australia

Hospital:	ROYAL DARWIN	GP:	No Gp Non
Unit:	Infectious Diseases	Ref 1:	Not On Table
Location:	4B - Medical *28488*	Ref 2:	
Room/Bed:	-703	Ref 3:	

Test 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

Authorized for release by Dr Rob Baird

mission
e bla^{NDM-1}
Tai

Clinical focus

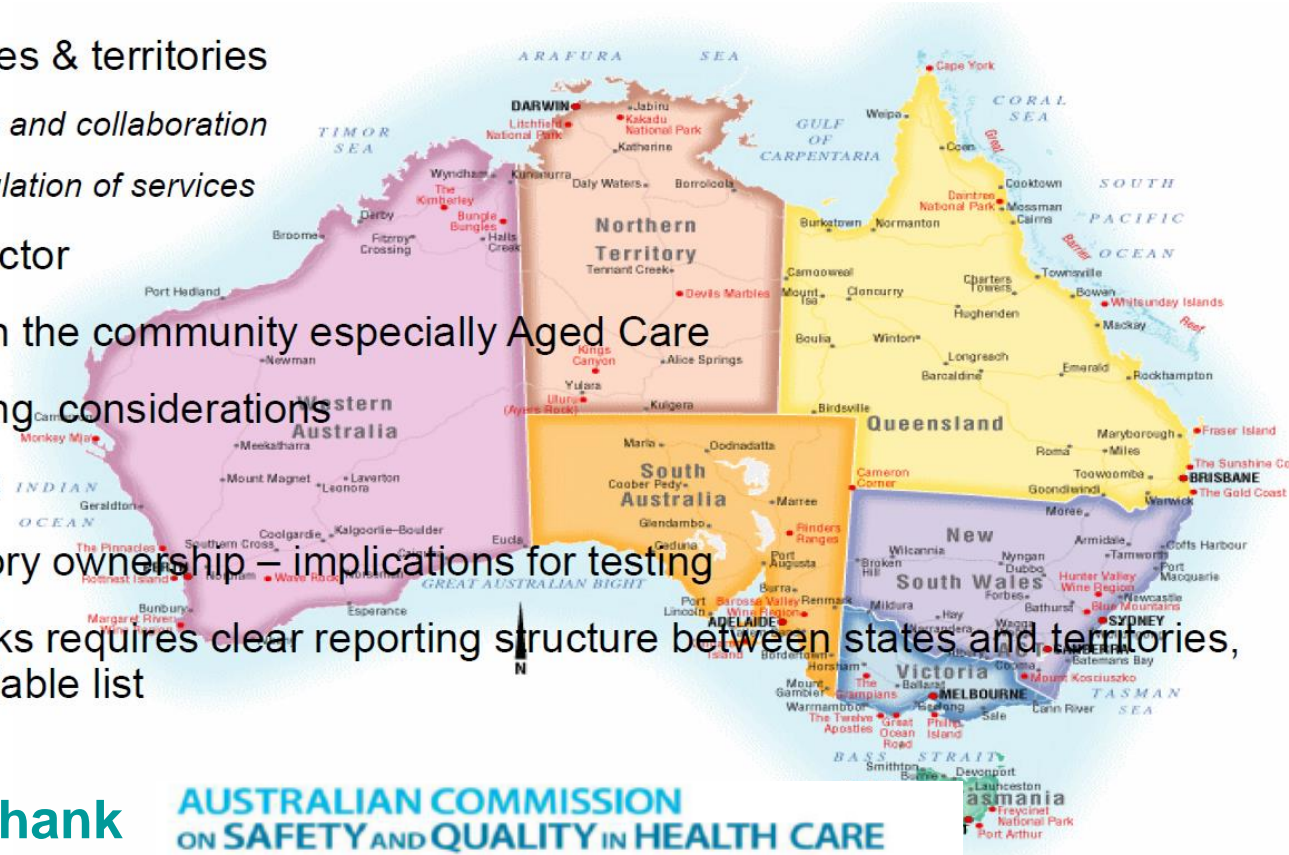
Australia
rris

is travel to
e

y established
multifaceted

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

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

Amanda R McCullough¹, Allan J Pollack², Malene Plejdrup Hansen³, Paul P Glasziou¹, David FM Looke⁴, Helena C Britt⁵, Christopher B Del Mar⁶

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.

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

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



417 585

Friday 28 July 2017 05.03 AEST



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Antibiotic use in poultry: a survey of eight farms in Thailand

Gumphol Wongsuvan,^a Vanaporn Wuthiekanun,^a Soawapak Hinjoy,^b Nicholas PJ Day^c & Direk Limmathurotsakul^a

Per kg final weight, each chicken raised for company B was reportedly routinely given a mean of 101 mg of antibiotics: 33 mg of amoxicillin, 29 mg colistin, 19 mg oxytetracycline, 18 mg doxycycline, 2 mg tilmicosin.

The total amount of antibiotic used on all Thai chickens raised for meat in 2016 was estimated to be 161 tonnes.

Fig. 2. An empty tub, previously used to store colistin powder, on a rural chicken farm, Thailand, 2016



A colistin crisis in India

Despite some global progress in limiting the use of antimicrobials in animals, inappropriate colistin use is still widespread. Madlen Davies and Timothy R Walsh report.



When the first mobile genetic mechanism for conferring colistin resistance, a gene called *mcr-1*, was reported in 2015, the news was met with worldwide alarm. Colistin is a drug of last resort, used to treat Gram-negative multidrug-resistant infections. The rapid spread of resistance to colistin could quickly result in untreatable infections. *mcr-1* has since been detected in bacteria from animals and humans in more than 30 countries, spanning five continents. Analogues (*mcr-2*, *mcr-3*, *mcr-4* and *mcr-5*) have

of *Klebsiella pneumoniae* are thought to be resistant to carbapenems, and therefore India relies heavily on colistin to treat life-threatening infections in human beings. By comparison, in the UK, carbapenem resistance in *K pneumoniae* is below 1%.

“In India, at least five animal pharmaceutical companies advertise products containing colistin as growth promoters or to be used metaphylactically”

Only Jubilant Foods (which owns Domino's) has set a date of 2019 to start its phase out. When invited to respond, Venky's said: “Our antibiotic products are for therapeutic use—although some of these in mild doses can be used at a preventive level, which in turn may act as growth promoters...We do not encourage indiscriminate use of antibiotics”.

In India, the Ministry of Agriculture sent an advisory letter to all state governments in 2014 asking them to review the use of antibiotic growth

Lancet Infect Dis 2018

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[http://dx.doi.org/10.1016/S1473-3099\(18\)30072-0](http://dx.doi.org/10.1016/S1473-3099(18)30072-0)

For more on the identification of *MCR-1* see *Lancet Infect Dis* 2016; 16: 293

For more on colistin use in China and *mcr-1* see *Lancet Infect Dis* 2016; 16: 161–68

For the Bureau of Investigative Journalism's full report on the story see <https://www.thebureauinvestigates.com/stories/2018-01-30/a-game-changing-battle-between-indian-poultry>



**MAKE ANTIBIOTICS
GREAT AGAIN**