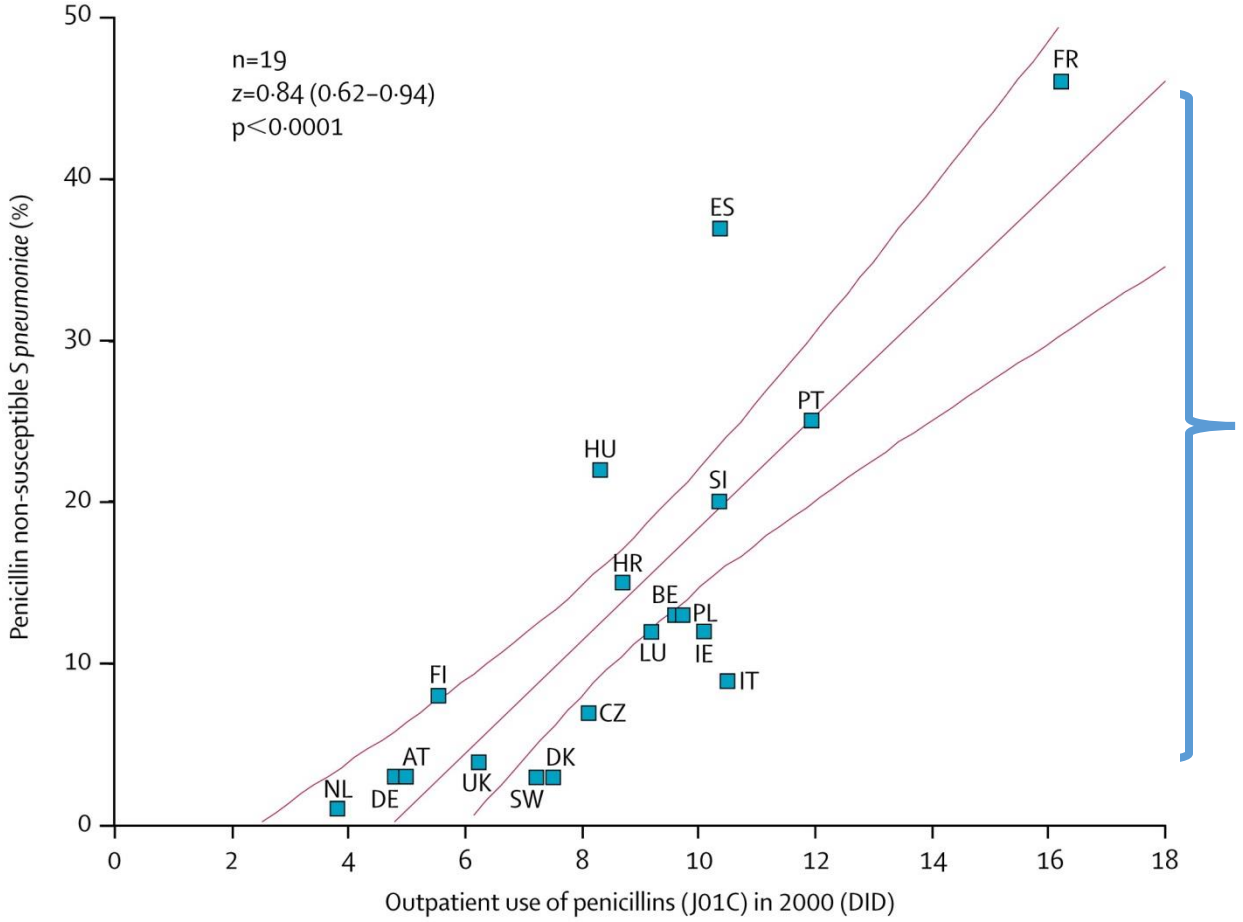
# Improving antibiotic prescribing in primary care

Paul Glasziou for the CREMARC research group

*** The Centre for Research Excellence in Minimising Antibiotic Resistance from Acute Respiratory Infections (NHMRC 2018-2022)**

40 years of antibiotic guidelines anniversary seminar, 2018

# Could reducing antibiotics by 50% double the life span of our antibiotics?




Halving penicillin use at least halves resistance; Should double "life" of new antibiotics?

**Outpatient antibiotic use in Europe and association with resistance: a cross-national database study**

Prof Herman Goossens, MD, Matus Ferech, PharmD, Robert Vander Stichele, MD, Monique Elseviers, PhD, for the ESAC Project Group

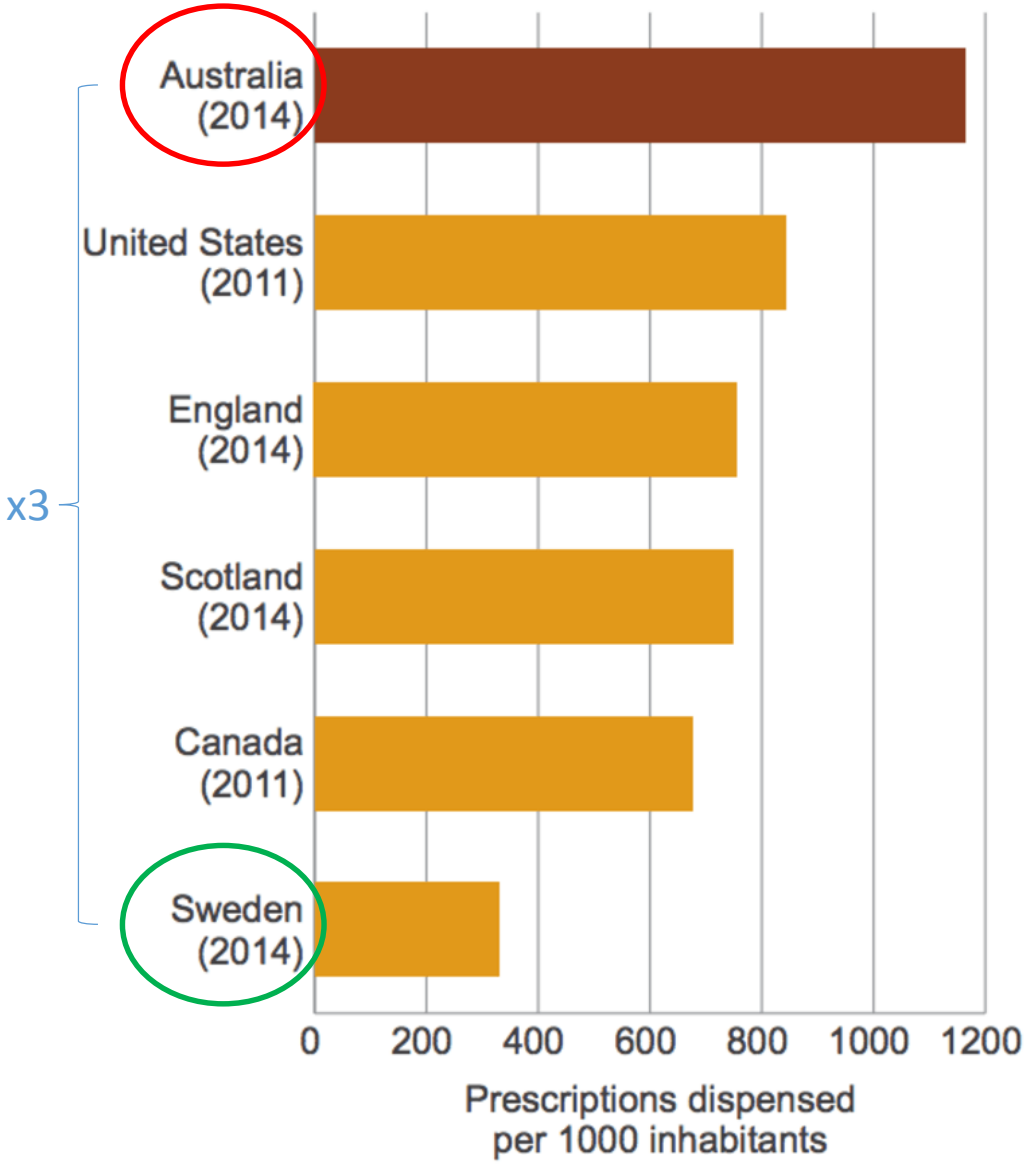
Published: 12 February 2005

Lancet 2005

# Overview

1. Trends in antibiotic use: Australia vs International
2. What works to improve antibiotic use?
3. What their potential population impact?
4. What should Australia do?

**Figure 5.3** Comparison of community antimicrobial use in Australia and other countries

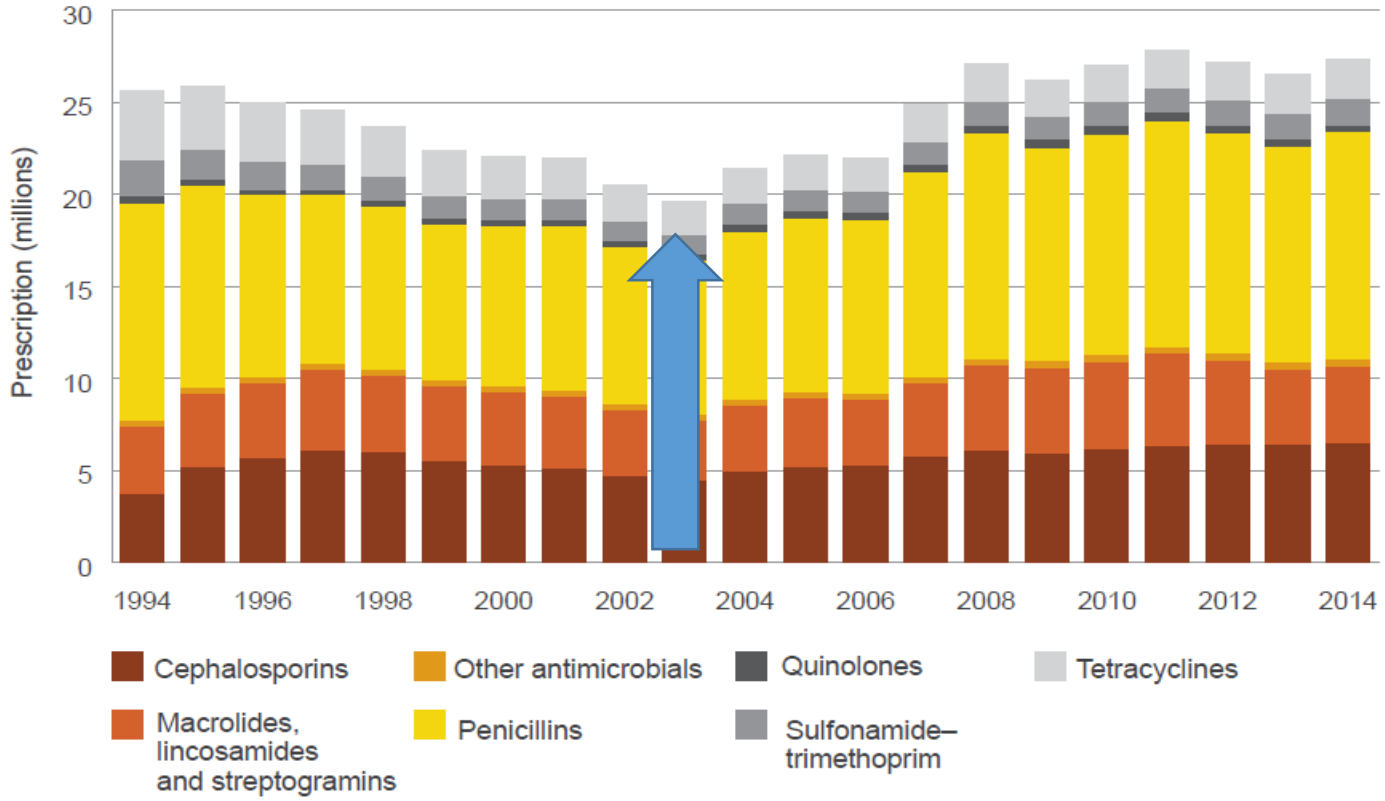



"In 2014, there were more than 30 million scripts dispensed for systemic and topical antibiotics in Australia. It was found that at least 45% of Australians took at least one course of antibiotics during that year."

John Turnidge
Medical Republic, Dec 2016

# The Fall and Rise of Antibiotics in Australia (PBS 1994-2014)

Figure 3.16 Systemic antimicrobial prescriptions dispensed, by therapeutic group, 1994–2014




Notes:

1. Other antimicrobials include amphenicols and aminoglycosides.
2. Before April 2012, includes estimates of under co-payment and private dispensing; after April 2012, includes actual under co-payment data, but no estimate from private dispensing

Source: Drug Utilisation Sub Committee database, October 2015

# Strama – The Swedish Strategic Programme against Antibiotic Resistance

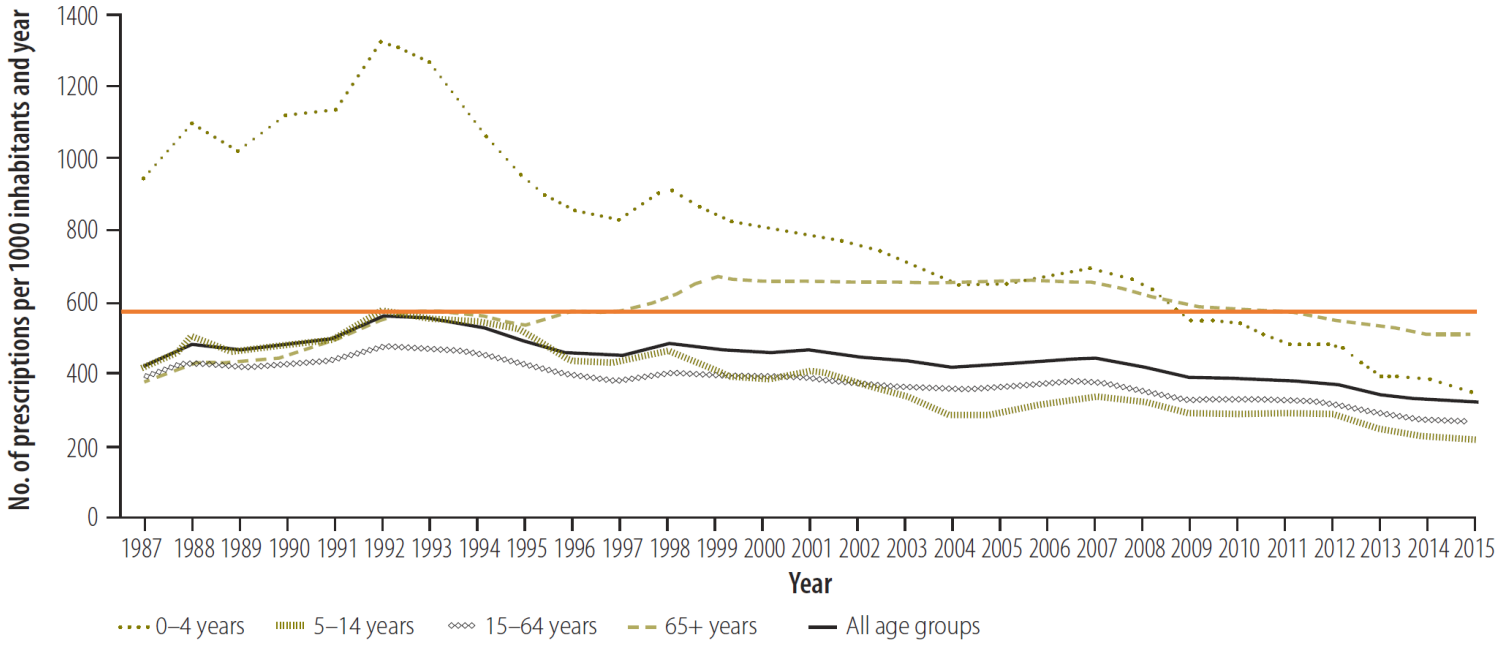
Like in many other countries, antibiotic use in Sweden increased steadily during the 1980's and early 1990's. This fact together with a rapid spread of multidrug-resistant pneumococci among children in southern Sweden, initiated a national program against antibiotic resistance, Strama.

## Data on antibiotic use is a key driver for change

Sigvard Mölstad et al.

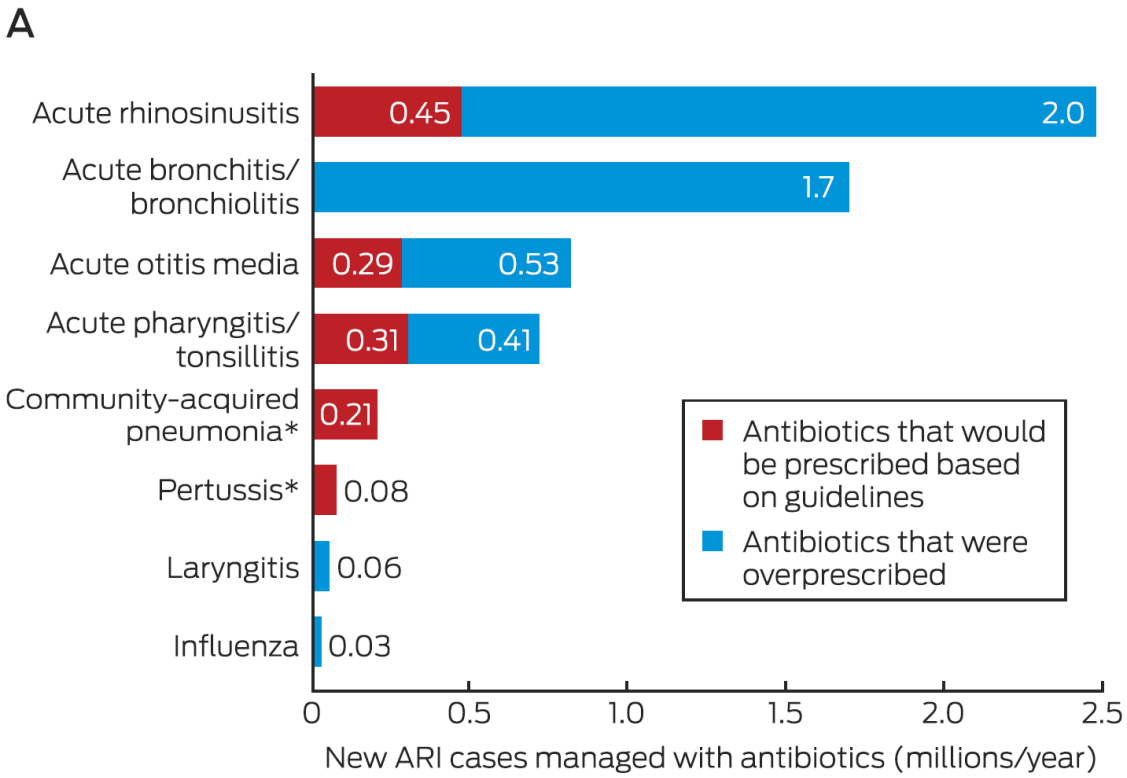


Fig. 1. **Sales of antibiotics for systemic use in outpatient care, Sweden, 1987–2015**



# 4.6 of 6M antibiotics not needed for acute respiratory infections

4 Numbers of new acute respiratory infection (ARI) cases managed with antibiotics each year in Australia: current practice and estimated maximum guideline-recommended rates. A. Numbers of new cases, nationally; B. New cases per full-time equivalent (FTE) general practitioner

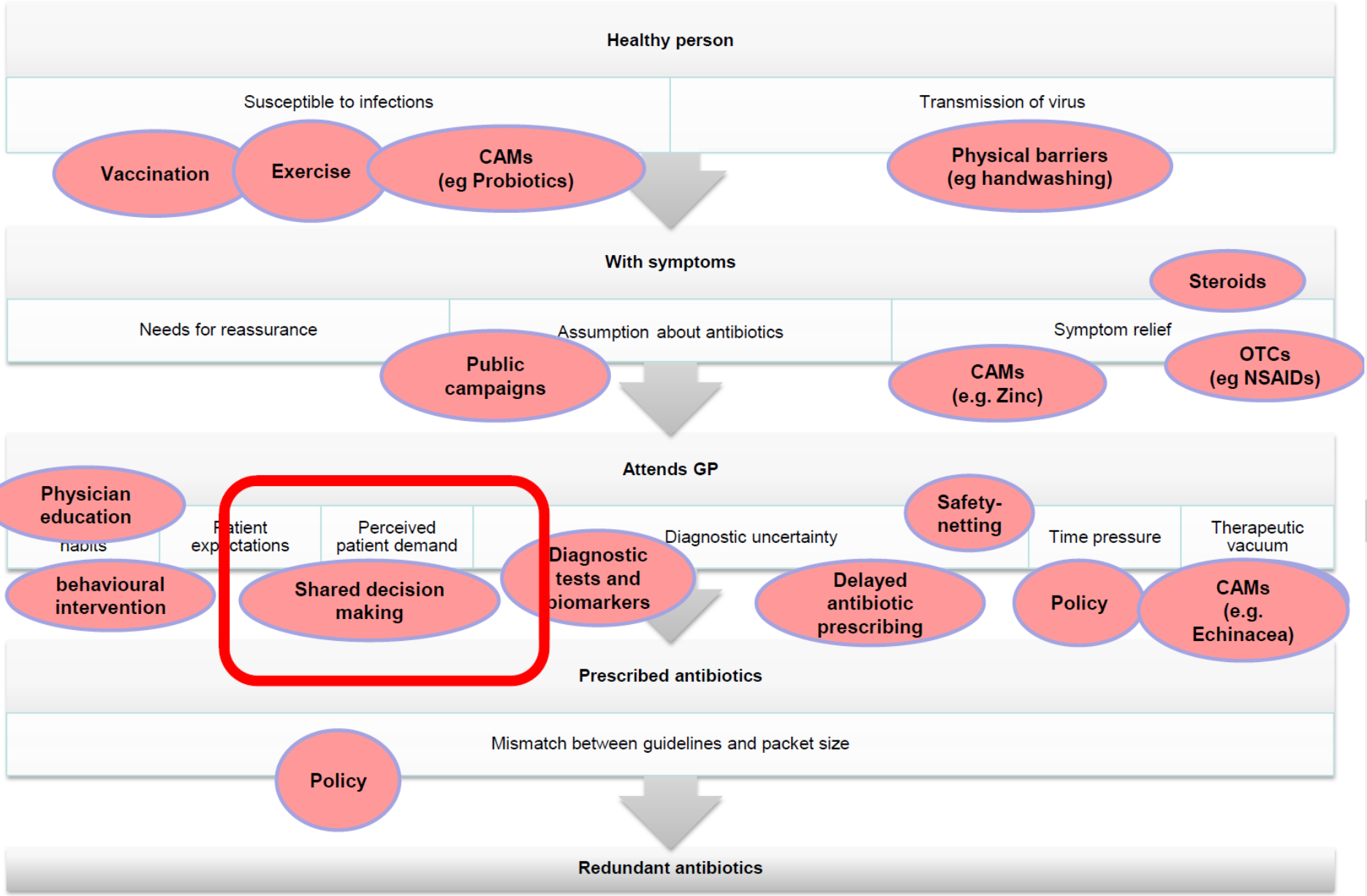




McCullough et al MJA 2016;

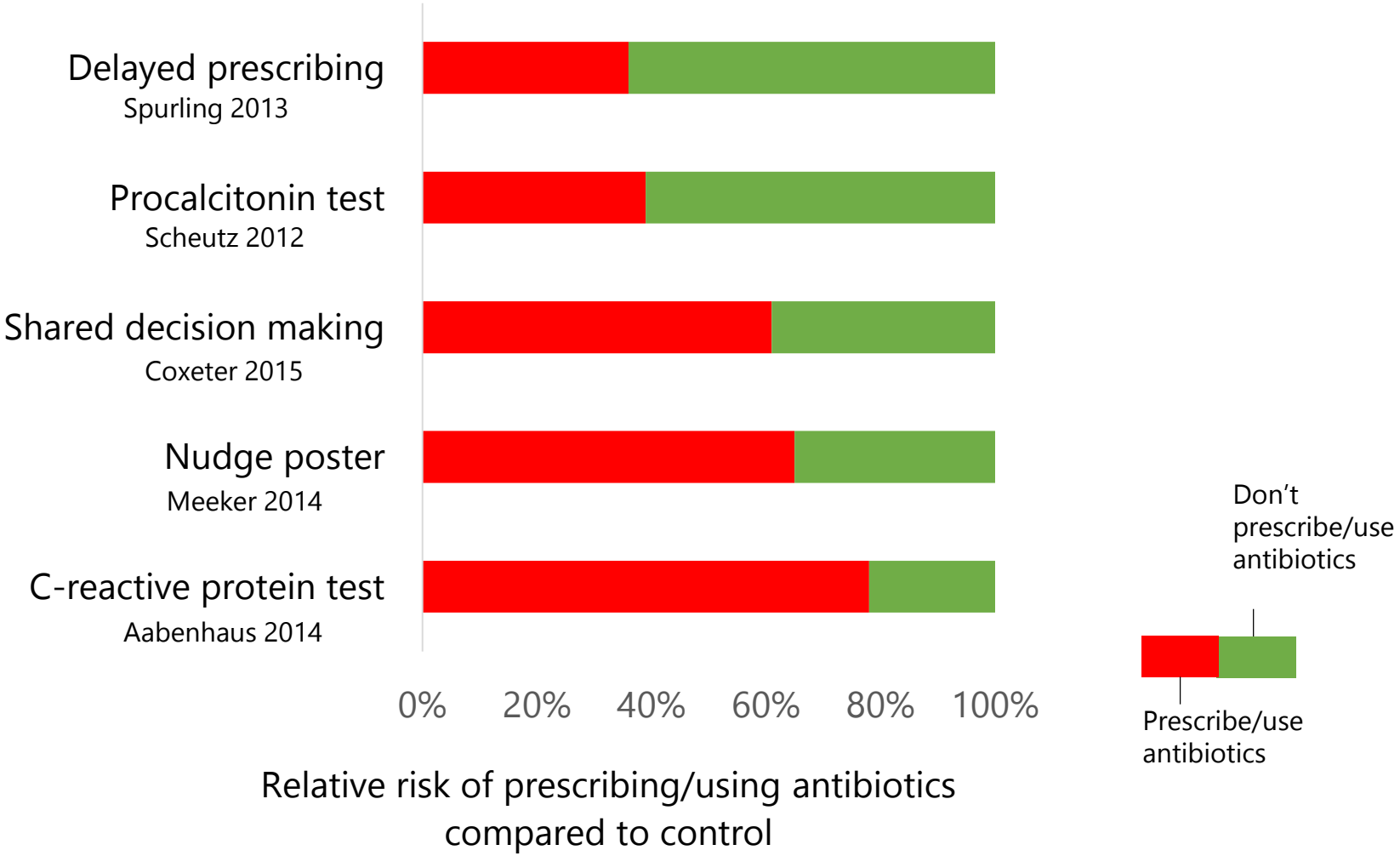
# How can we change behaviour?

# Many possible points for intervention




Hansen *Front Pub Health* 2015;3:35.

# Effective strategies to reduce antibiotic use for acute respiratory infections






Bell 2016; submitted

# But GPs don't use them …

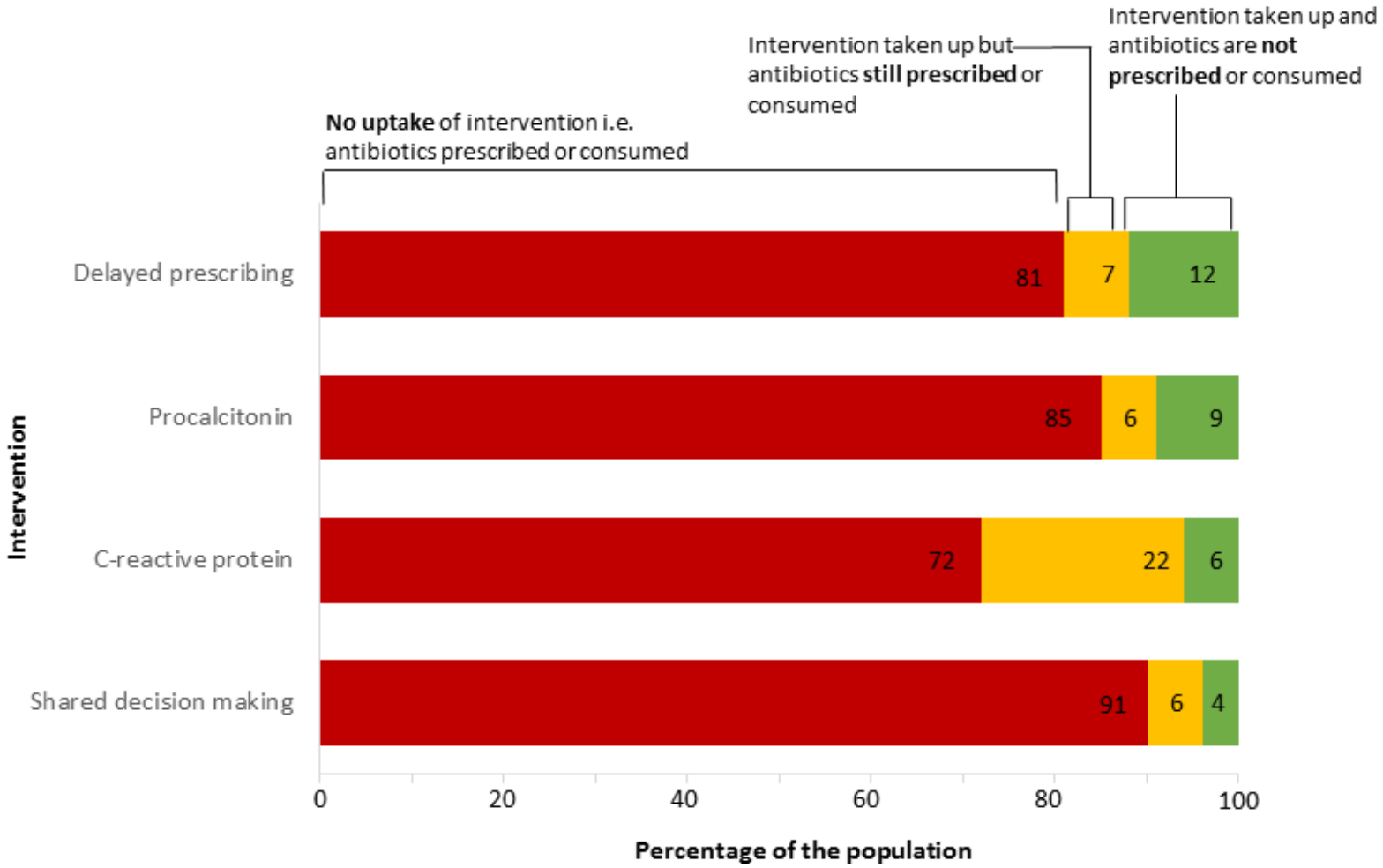



Figure 1. Estimated population level effectiveness of four interventions that aim to reduce antibiotic use for acute respiratory infections

# So what if we <u>combine</u> interventions to reduce unnecessary antibiotics?

**Delayed Prescription**
to be dispensed
if symptoms persist
or become more severe

GAPS

THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

BOND UNIVERSITY
FACULTY OF HEALTH SCIENCES & MEDICINE

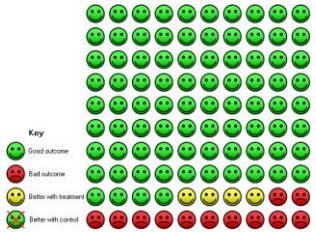
QUT
Queensland University of Technology
Brisbane Australia

Practice poster

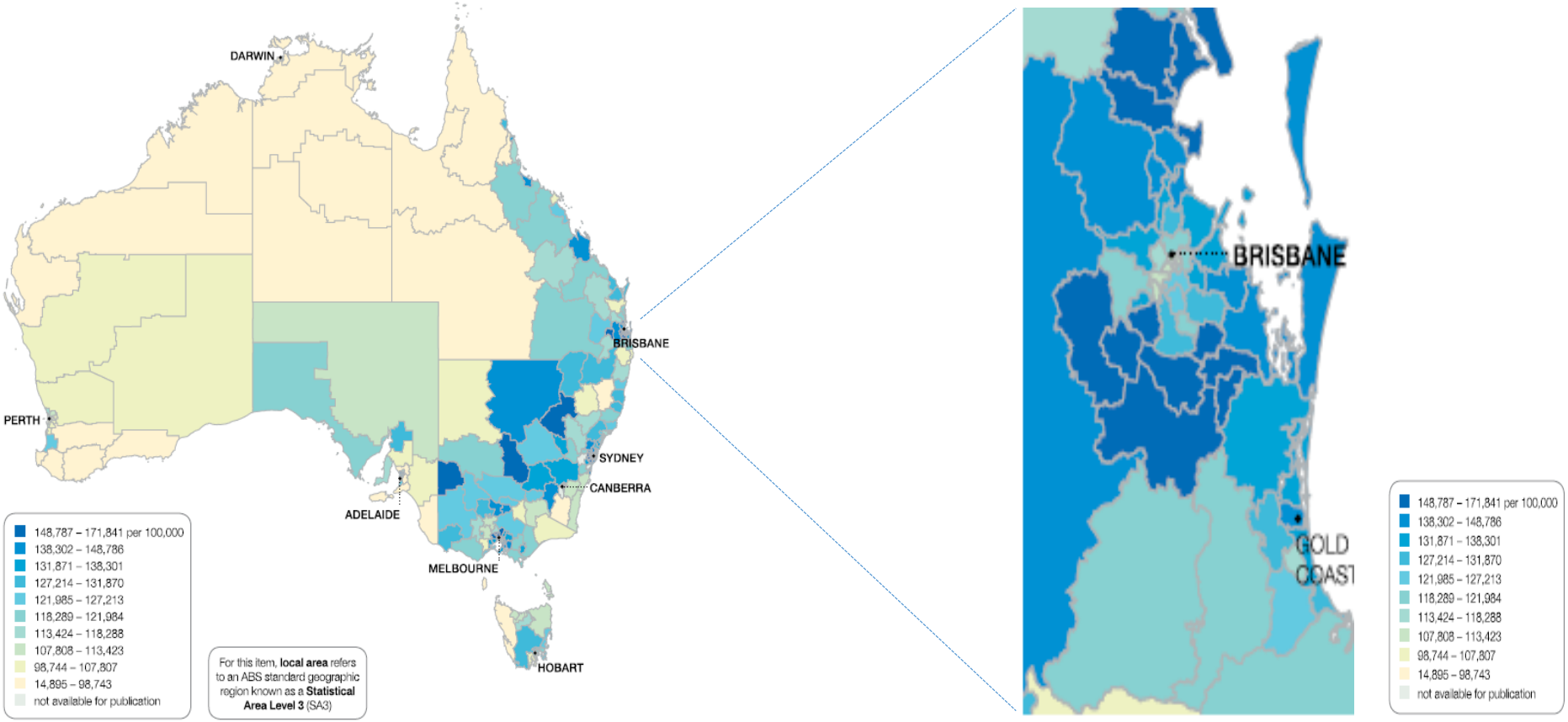
patient pamphlet


delayed prescribing


access to near patient testing with C-reactive protein (CRP)


patient decision aids

# Variations in antibiotic prescribing




125,119 antibiotics dispensed/100,000 people

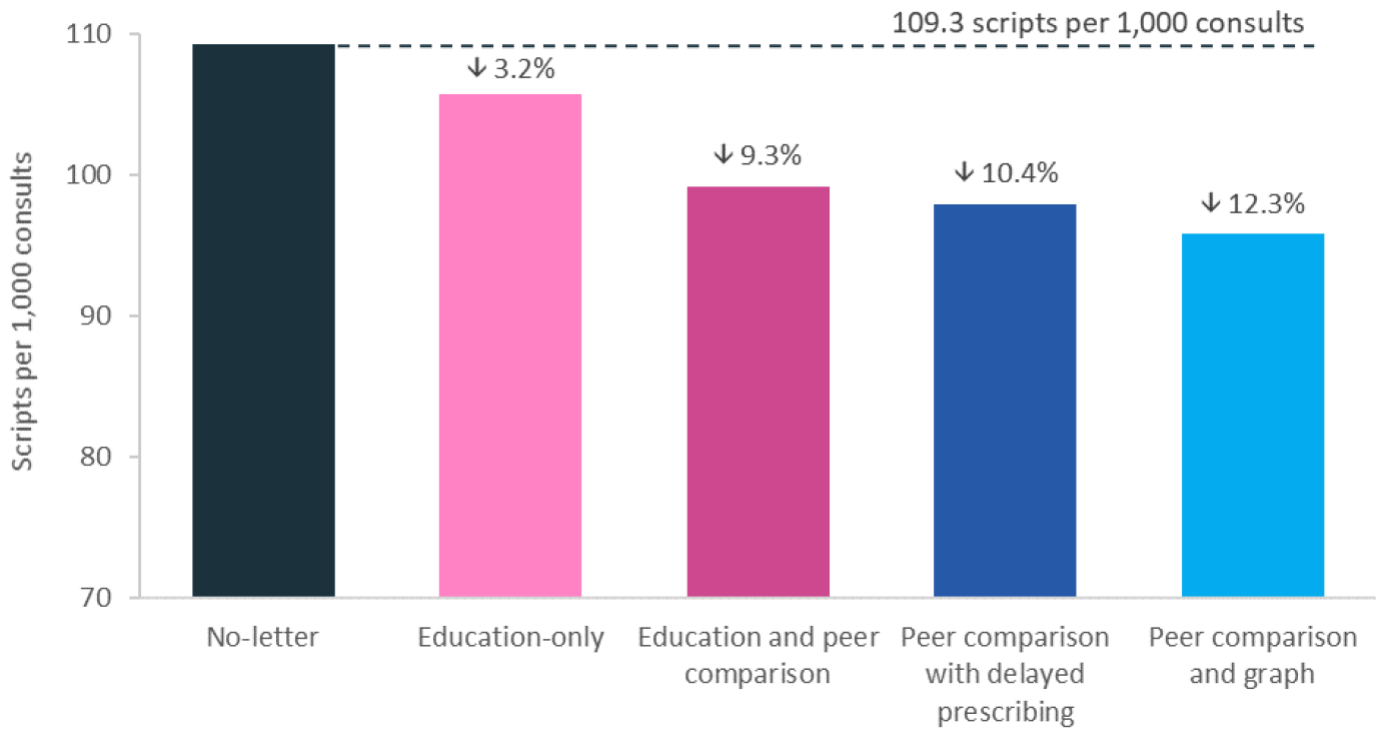
SE Qld is no different to the rest of Australia

# Nudge vs Superbugs

A behavioural economics trial
to reduce the overprescribing of antibiotics

**June 2018**

**Main findings for six months combined (prescription rates)**



OECD Health Policy Studies

# Stemming the Superbug Tide

## JUST A FEW DOLLARS MORE

**A broad policy package combining stewardship programmes, enhanced environmental hygiene, mass media campaigns, and rapid diagnostic testing could avert 180 deaths and save 15 million dollars per year in Australia**

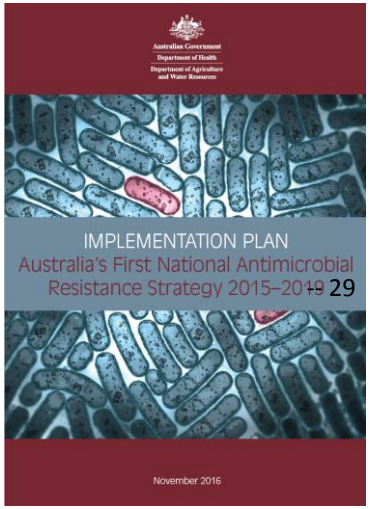
| | Lives saved per year | Costs per year (million) | Return per dollar invested |
|---|---|---|---|
| **Improving hand hygiene** is one of the most effective strategies to prevent hospital-acquired infections | 150 | -$7 | 1.9 |
| **Stewardship programmes** aim to increase awareness and to rationalise prescription practices among health care personnel | 140 | -$3.5 | 1.5 |
| **Enhanced environmental hygiene** encompasses the decontamination, disinfection, cleaning and sterilisation of hospital environments and equipment | 140 | $0.7 | 0.9 |
| **Delayed antimicrobial prescribing** avoids unnecessary consumption of antimicrobials in outpatient and primary care settings | 35 | $0.1 | 0.8 |
| **Mass media campaigns** raise public awareness about the dangers associated with inappropriate antimicrobial prescription | 16 | $0.04 | 0.9 |
| **Rapid diagnostic tests** determine, within hours, whether an antimicrobial treatment should be initiated and which should be used | 60 | $3.6 | -0.6 |

Results from the OECD SPHeP-AMR model

OECD

# Summary

- Australian antibiotic use greater than OECD average
- Dipped to low in 2003, but rising since
- Multiple interventions “work” but modest impact (need to improve both effects & uptake rates)
- Sustained stewardship program needed in primary care to slow/reverse resistance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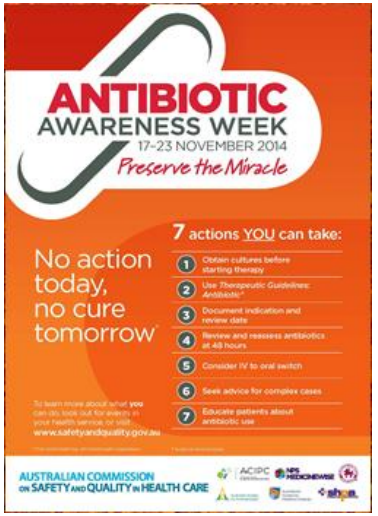
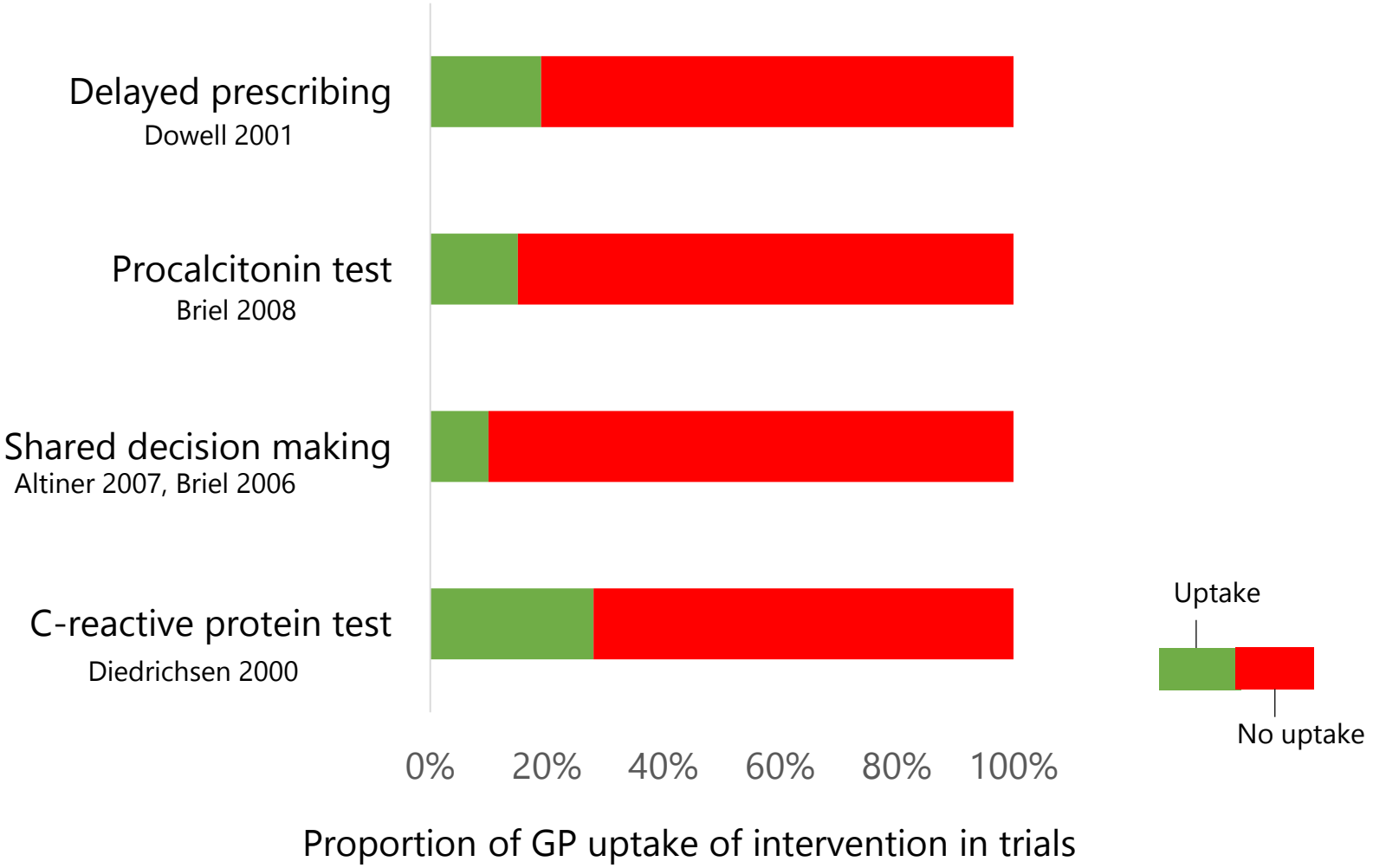


# What should we do while waiting for the new antibiotics?

# But GPs do not use them






Bell 2016; submitted

*BMJ* 2016;353:i3002 doi: 10.1136/bmj.i3002 (Published 26 May 2016)



NEWS

7%

# GPs achieve dramatic cut in antibiotic prescriptions

Jacqui Wise

London

GPs in England have dramatically cut antibiotic prescribing, giving 2.6 million fewer prescriptions last year, figures from NHS Improvement have shown.

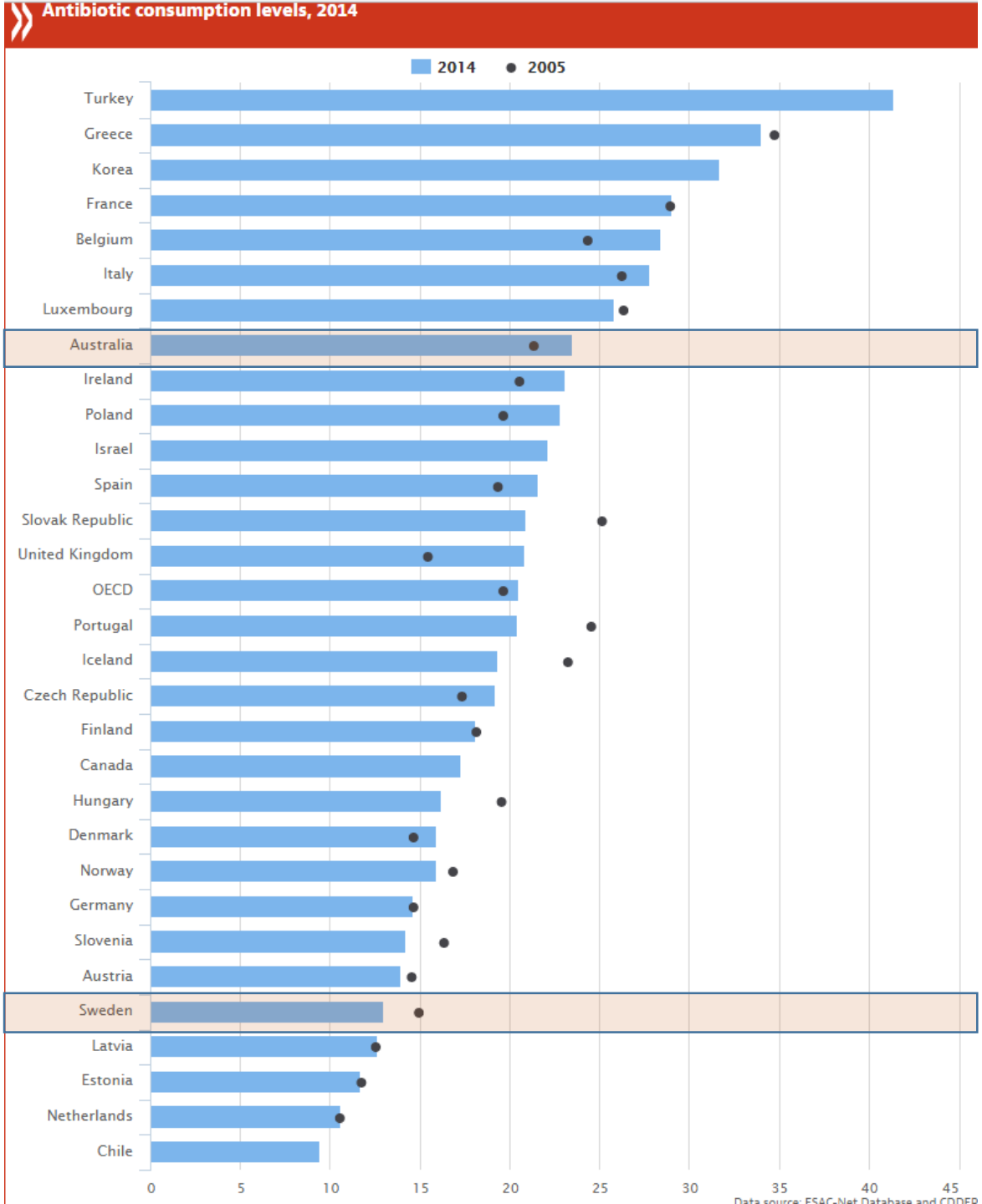
The total number of antibiotics prescribed by GPs fell by 7.3% in one year—down from 37 033 310 items in 2014-15 to 34 337 167 in 2015-16. This significantly exceeds the 1% reduction target that the national patient safety team set with Public Health England and NHS England.

Mike Durkin, NHS national director of patient safety, said, "This fantastic result achieved in just one year is testament to the huge efforts of GPs, pharmacists and local commissioners. Every year, too many people suffer and lose their lives due to antibiotic resistant infections.

"At a time when the NHS has advanced in many areas of patient care, science and technology, we must work to prevent healthcare going backwards to a time where antibiotics are no

7% decrease/year for 7 years => 50% (near Swedish levels)

Long-term national stewardship programs needed


Antibiotic consumption levels, 2014
2014
2005
Turkey
Greece
Korea
France
Belgium
Italy
Luxembourg
Australia
Ireland
Poland
Israel
Spain
Slovak Republic
United Kingdom
OECD
Portugal
Iceland
Czech Republic
Finland
Canada
Hungary
Denmark
Norway
Germany
Slovenia
Austria
Sweden
Latvia
Estonia
Netherlands
Chile
0
5
10
15
20
25
30
35
40
45
Data source: ESAC-Net Database and CDDEP

# The GP's tightrope walk

# **SWEDEN** Hospital admissions for acute mastoiditis, quinsy, and acute rhinosinusitis in children were stable or decreased 1987-2004

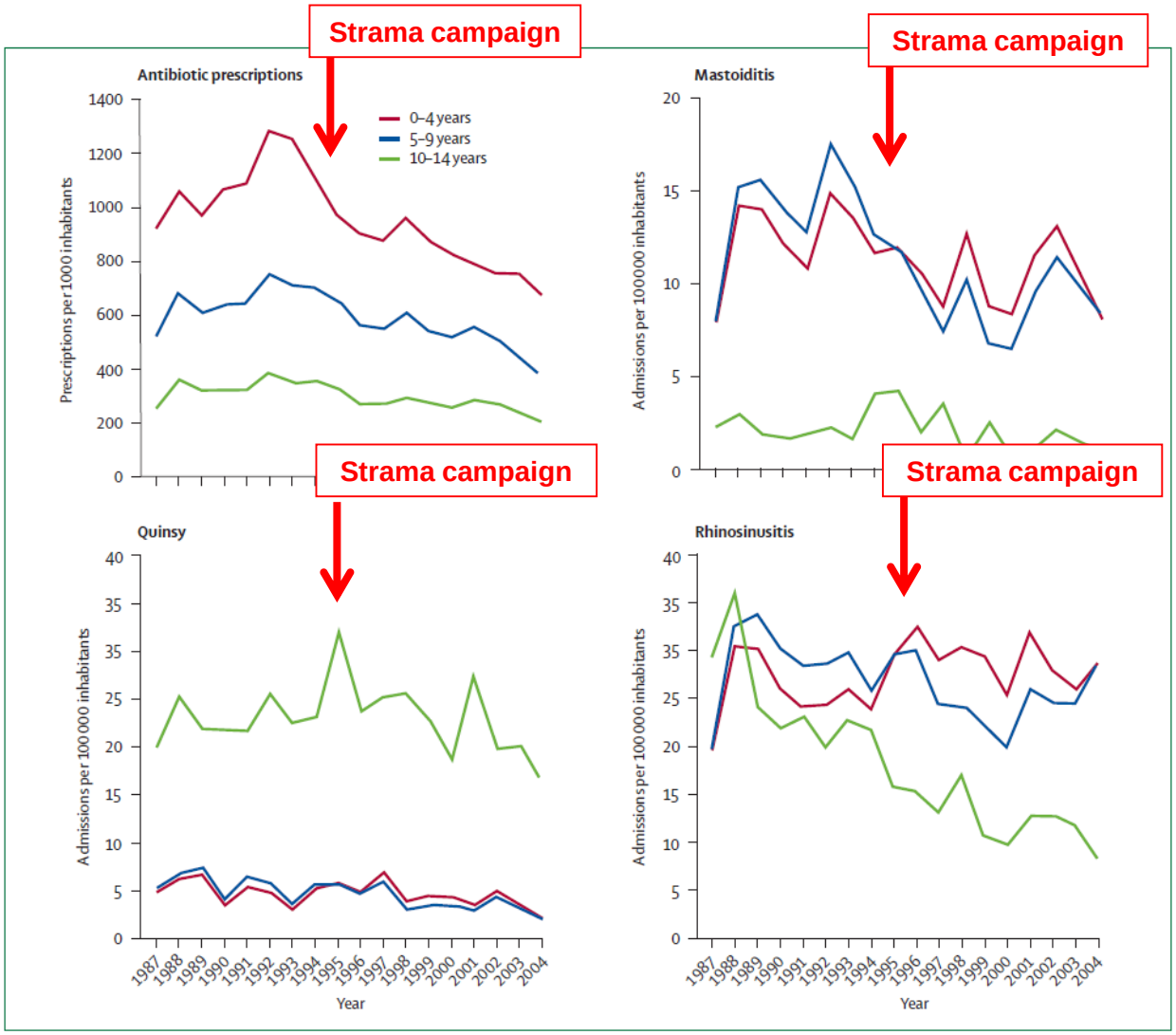
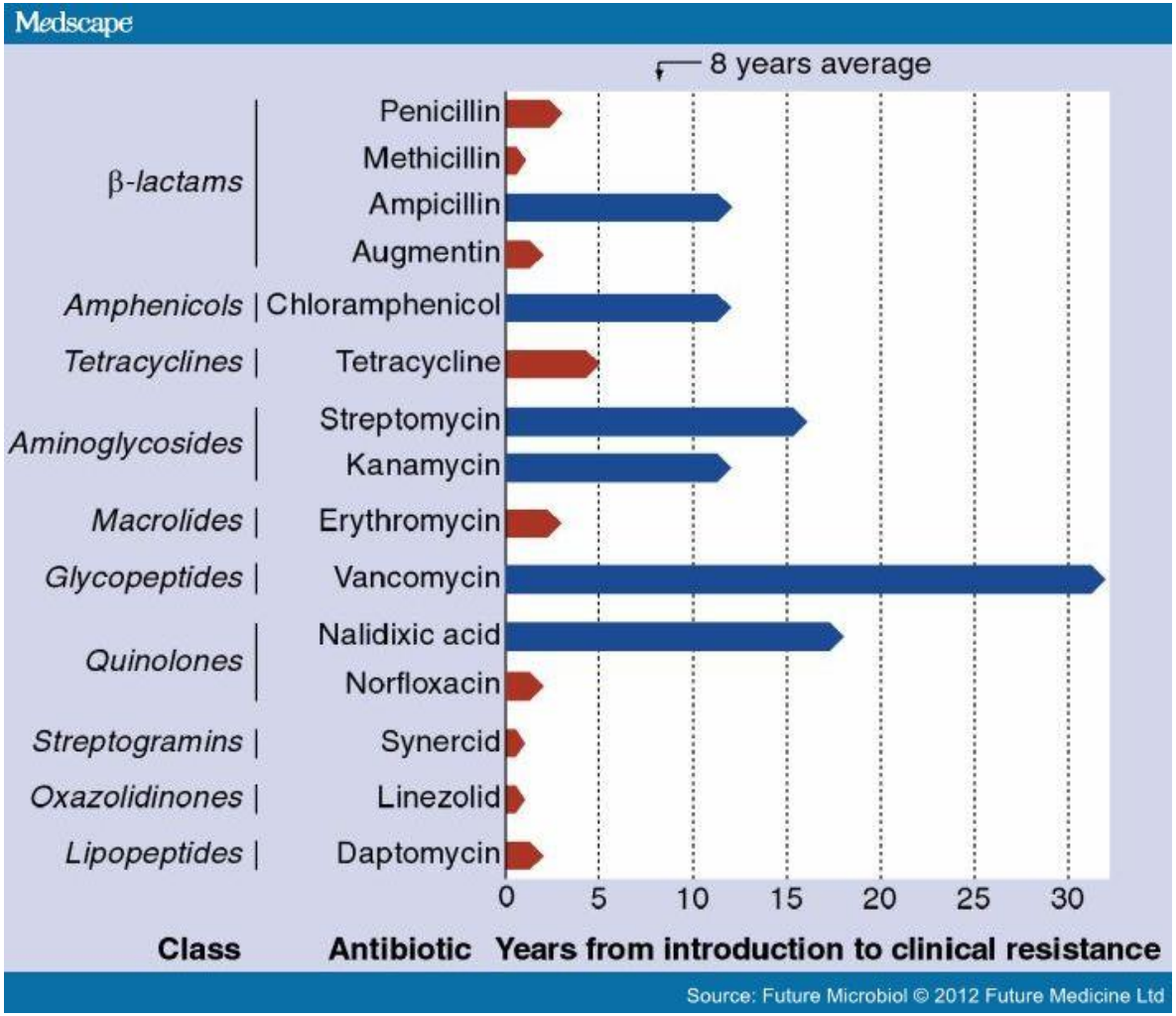


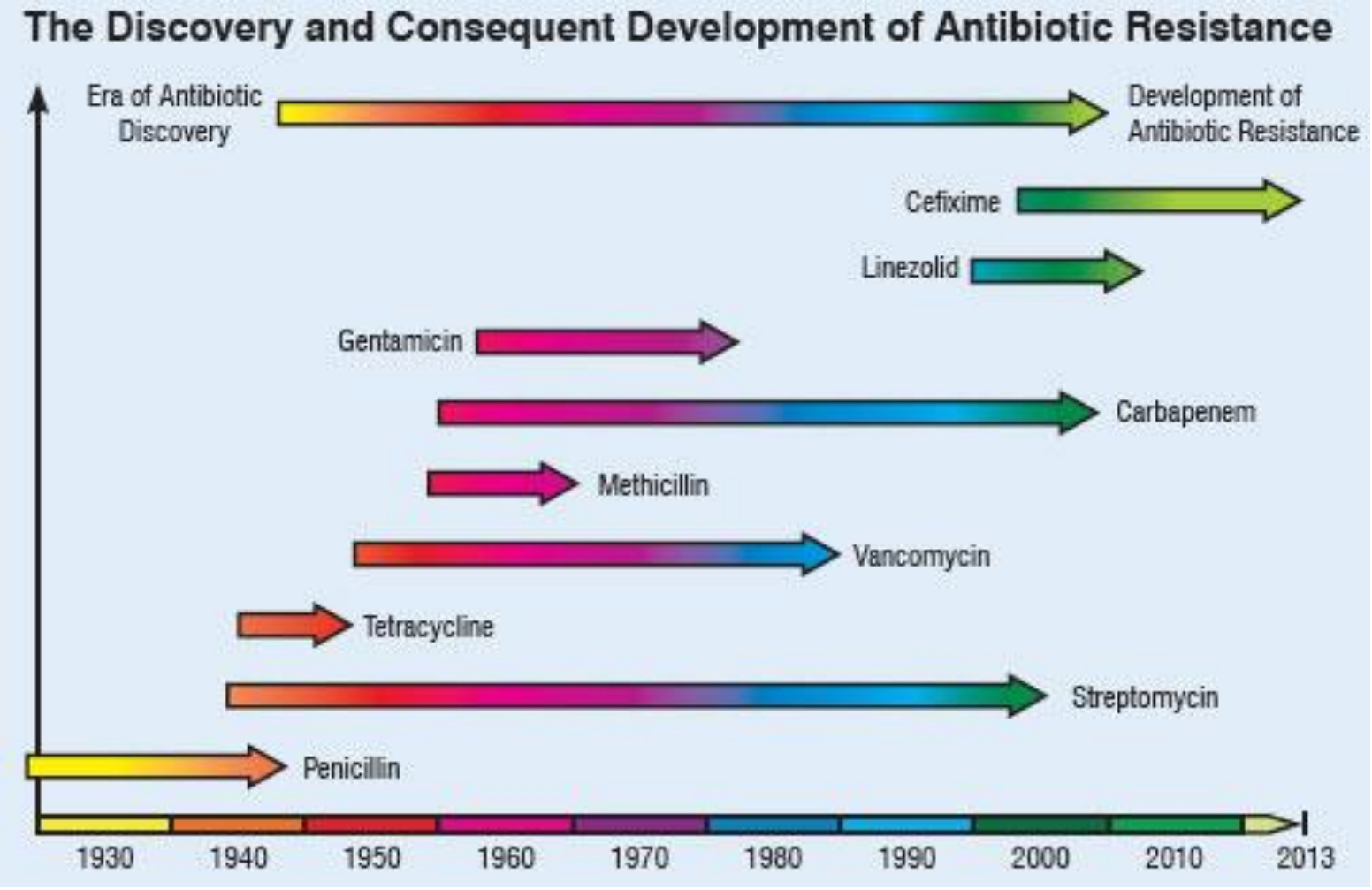

*Figure 4:* Antibiotic prescriptions and hospital admissions for acute mastoiditis, quinsy, and rhinosinusitis for children, by age (1987–2004)
From Cars et al.[6]

Data from the national registry of diagnosis in hospital care (National Board of Health and Welfare) ***Lancet Infect Dis* 2008; 8: 125–32**

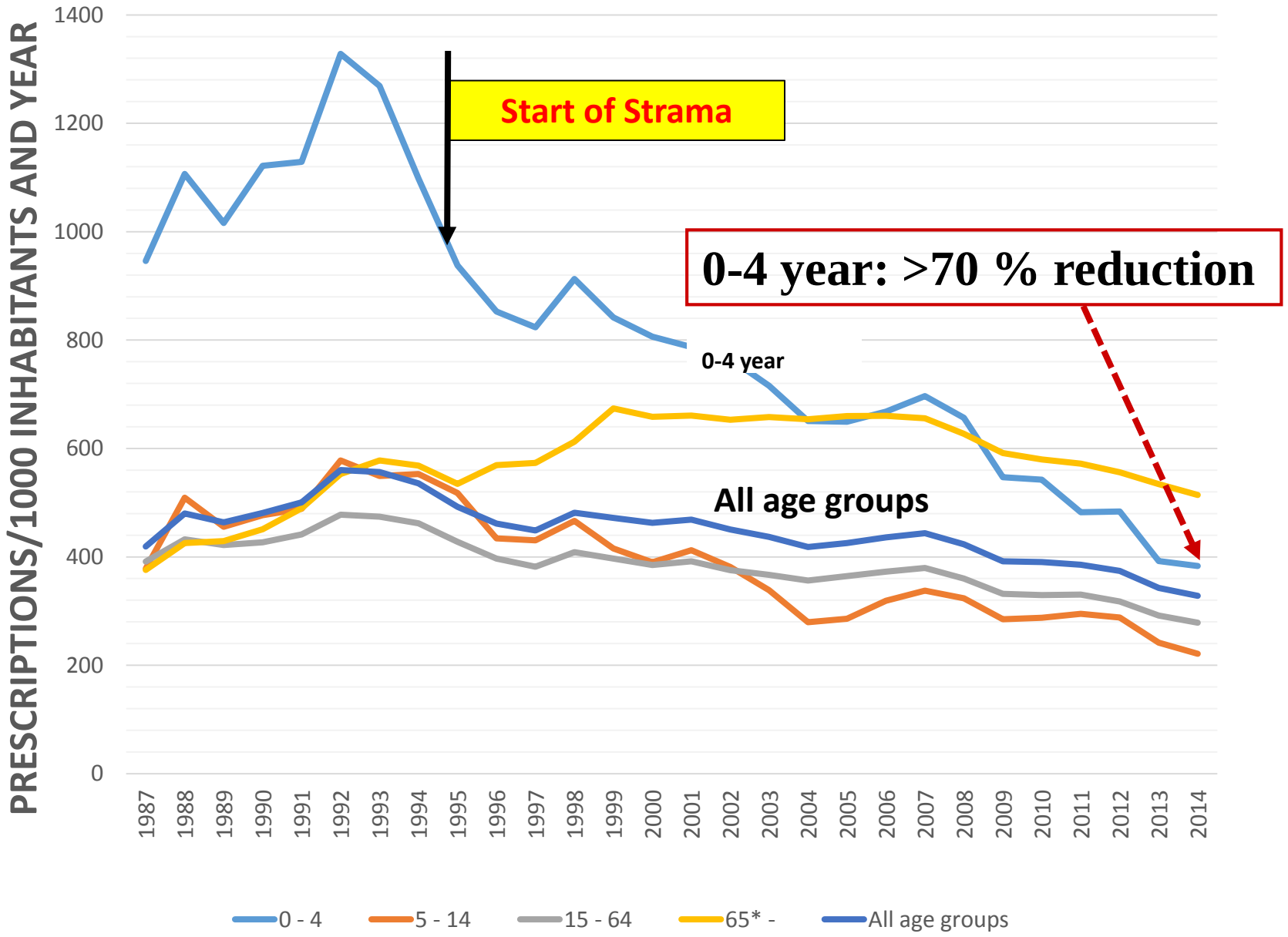
# From introduction to resistance



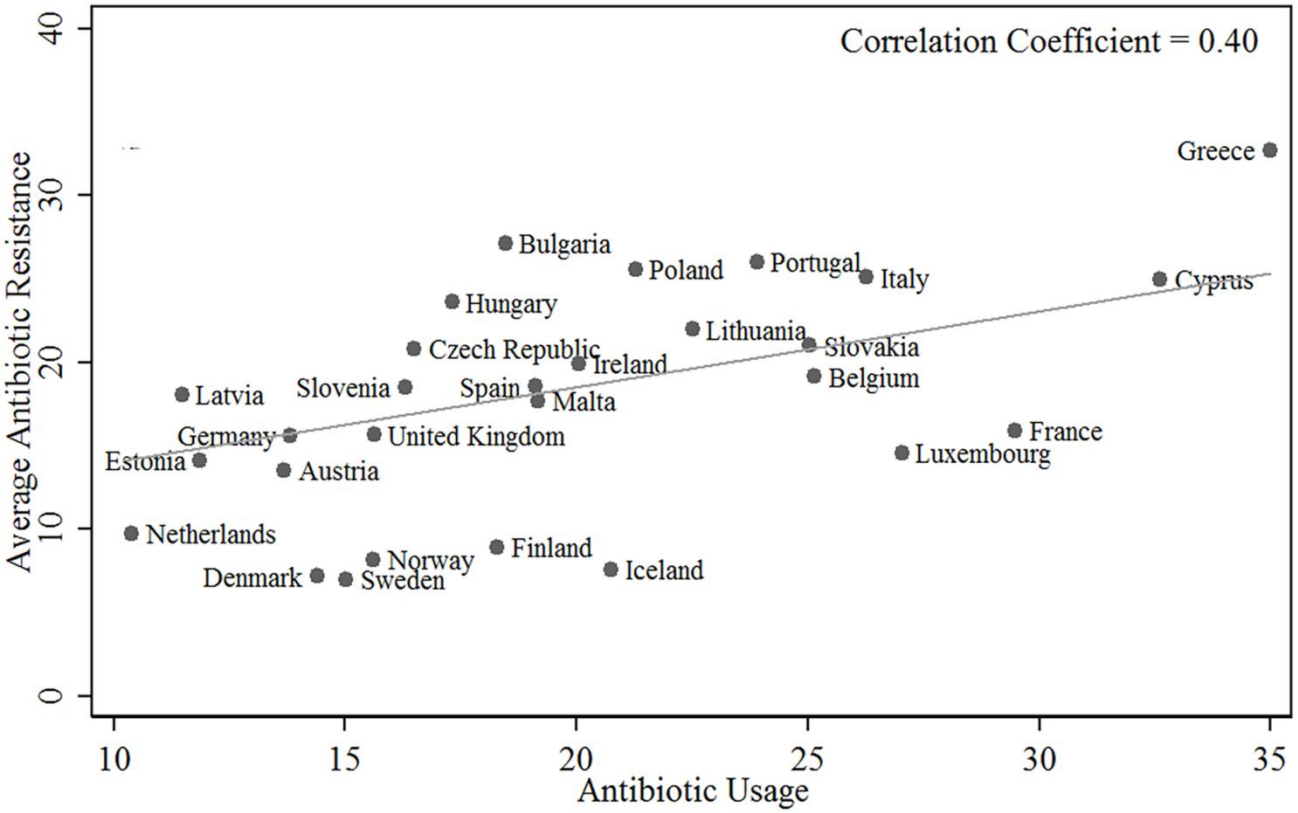
# Will new antibiotics help?



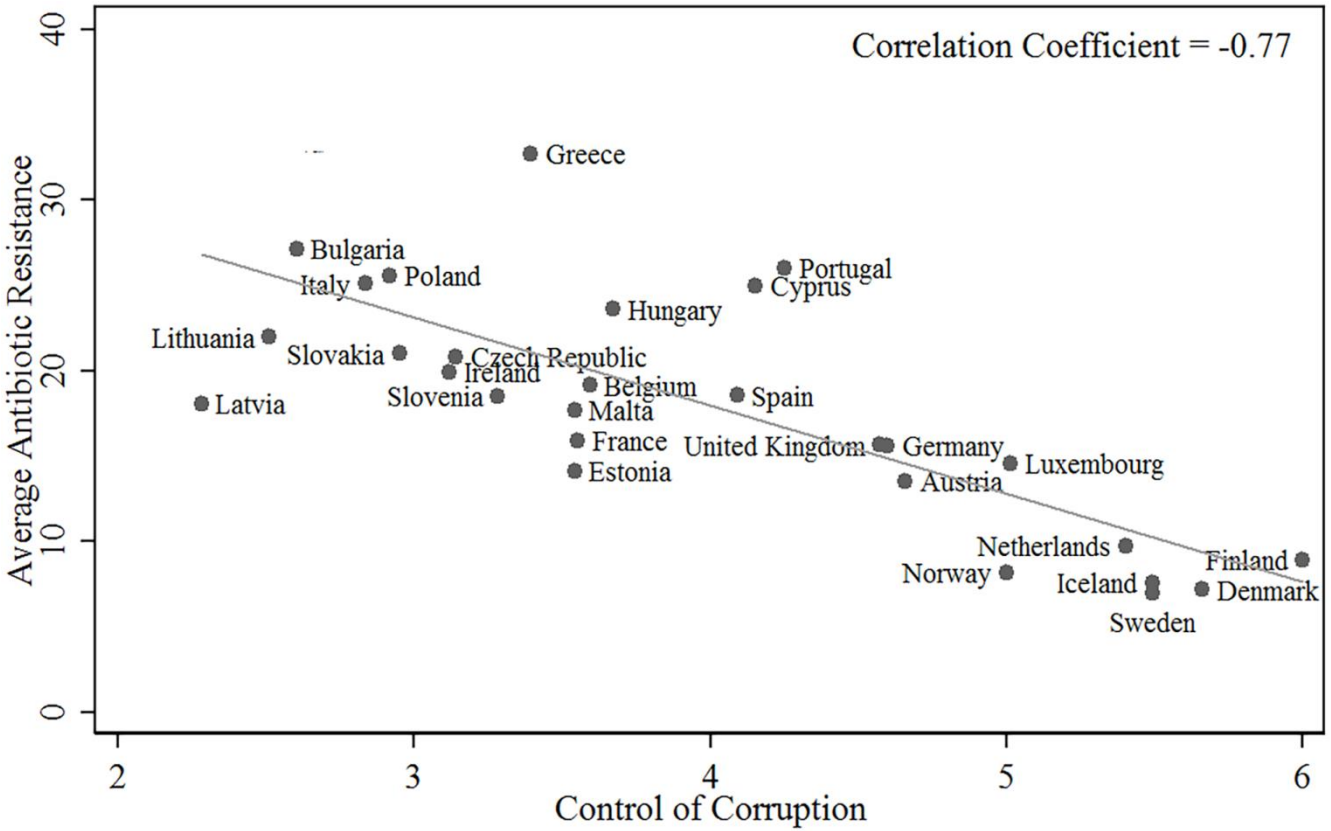
# The fall and fall of antibiotics in SWEDEN




Källa: Folkhälsomyndigheten 2015




Note: Average antibiotic resistance is from EARS-Net database of the European Centre for Disease Prevention
Antibiotic usage is from the European Surveillance of Antimicrobial Consumption (ESAC) Yearbook 2009




Note: Average antibiotic resistance is from EARS-Net database of the European Centre for Disease Prevention
The control of corruption indicator is from International Country Risk Guide