ECDC DIRECTOR'S PRESENTATION

The threat of antimicrobial resistance to patient safety & to national safety and security

International Conference on National Safety and Security, Rotterdam 11/2 2014

Ladies and gentlemen, dear colleagues,

Thank you for inviting me to this workshop on antimicrobial resistance, to discuss the threat that AMR poses to public safety and to national safety and security.

I am Marc Sprenger, Director of the European Centre for Disease Prevention and Control (ECDC) based in Stockholm, Sweden.

We are living in challenging times for public health.

In Europe, and globally, much of today's focus is on the on-going effect of the financial crisis, on the widespread conflicts around the world and on environmental disaster.

So my message concerning health and health protection may be difficult to pass on. But we must not forget that health is wealth. And one of the major threats to public health today is indeed the increasing resistance to antimicrobials.

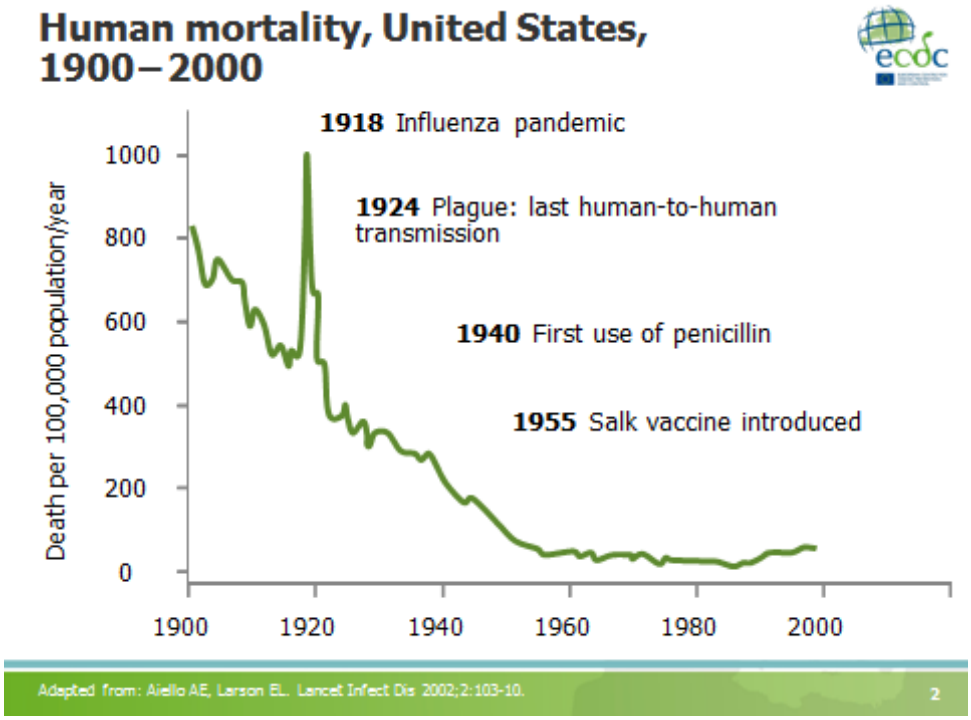
During the past century, we have seen a huge decline in human mortality. Two important discoveries in the history of medicine have contributed to this decrease;

1. The development of vaccines;
2. and the discovery of antibiotics

Disease that were previously difficult to treat, and sometimes lethal, were now treatable or preventable.

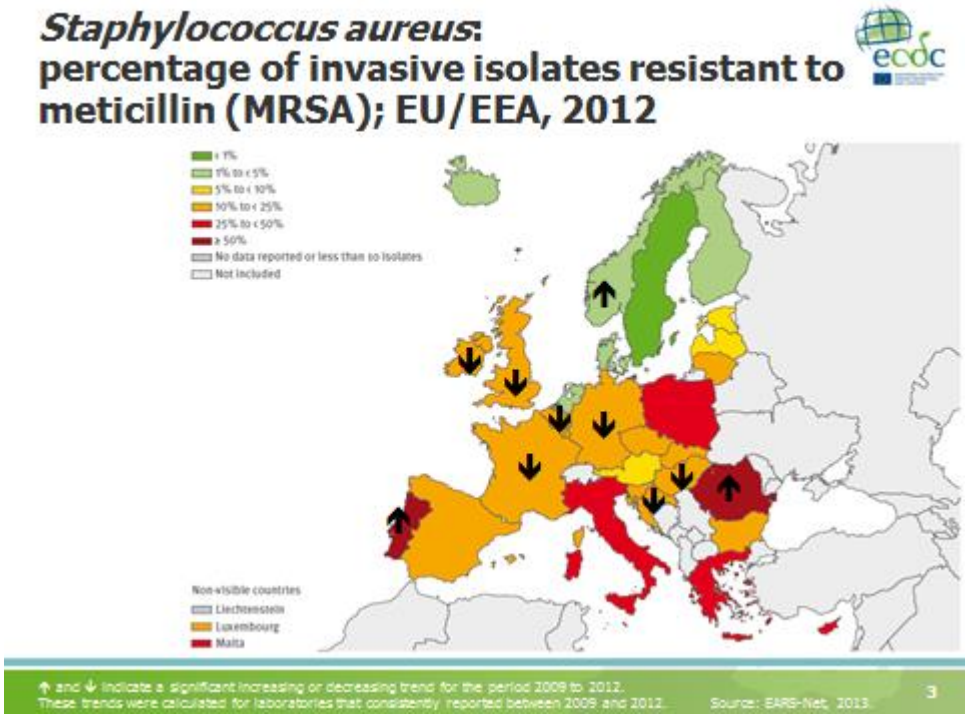
Antibiotics have been fundamental in the treatment of human infection such as gonorrhoea, pneumonia or tuberculosis.

Lives have been saved!



But for the past decades, antimicrobial resistance has become a major health threat. So what is the current situation in Europe regarding antimicrobial resistance?

This slide presents the latest data available for the EU and EEA countries.

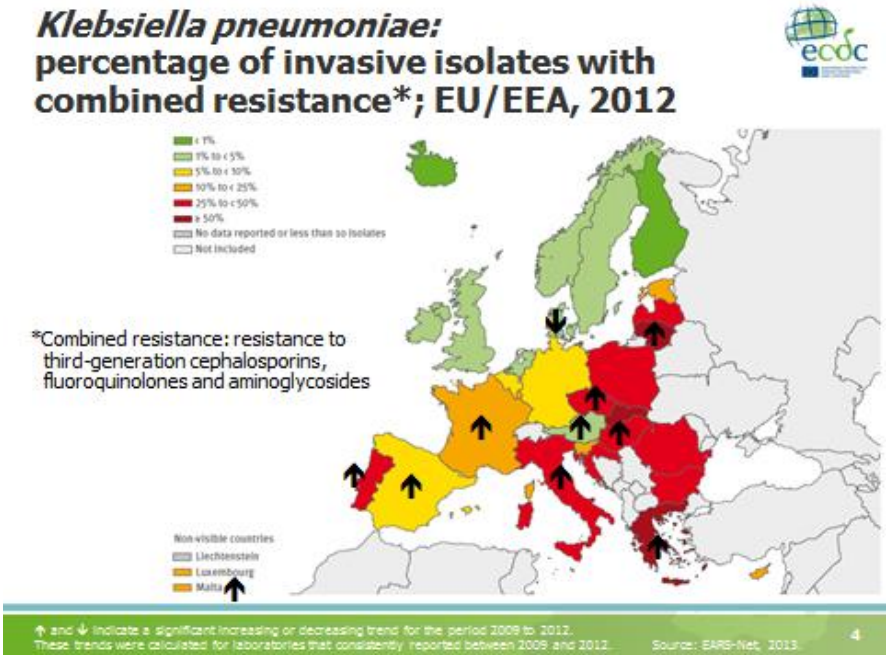


We see large variations among the countries, from less than 1% (*BRIGHT GREEN*) to more than 50% (DARK RED).

Now the good news is that in several European countries we see a declining trend of MRSA, if you compare the rates from 2009 and 2012.

But the bad news is that we see increased resistance in other bacteria.

Klebsiella pneumoniae - a bacterium commonly found in hospital infections - is increasingly becoming resistant to multiple antibiotics as shown on this map.

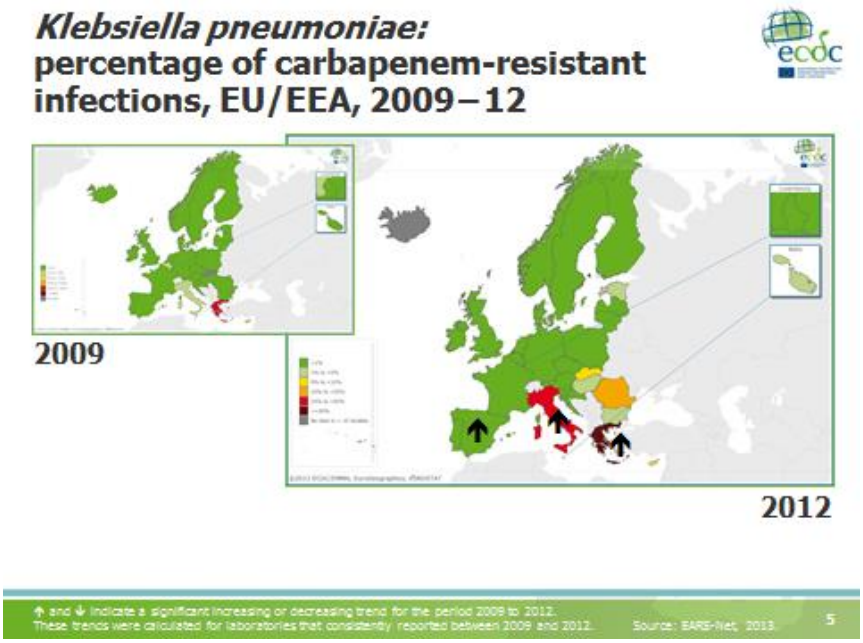


As a consequence, doctors in hospitals must increasingly rely on the type of antibiotics that should be seen as the last available resource to treat these patients, so-called last-line antibiotics; carbapenems.

And there is even worse news...

Due to the increased use of antibiotics and varying hospital infection control practices, *Klebsiella pneumoniae* is now even starting to show resistance to the main last-line class of antibiotics, known as carbapenems.

This slide presents the latest data available for Europe regarding the situation of carbapenem-resistant *Klebsiella pneumoniae* bloodstream infections.



The two maps on the previous slide show the situation across Europe, between 2009 and 2012. Unfortunately, we see that the rates for the past three years have markedly increased to above 5% in 5 countries, mostly situated in the south of Europe.

And the data we have is the tip of the iceberg.

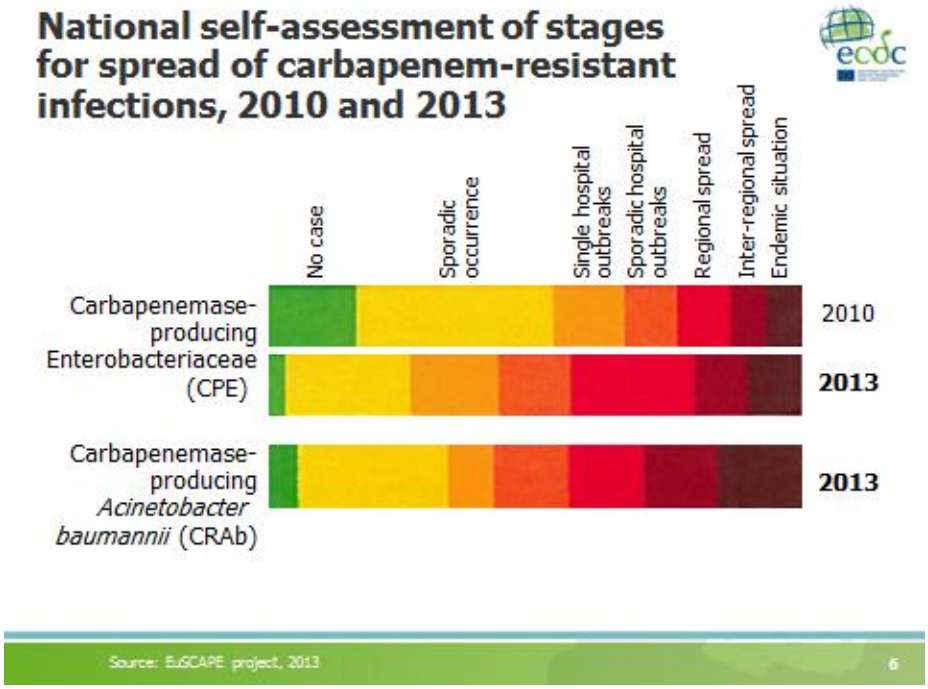
Options for treating patients infected with highly resistant bacteria are limited to antibiotics that are old, with limitations and toxic side-effects.

The slide here below shows the situation for carbapenem-resistant bacteria in more detail, and is based on the results of a survey across 38 countries. The survey was done for ECDC by the University Medical Centre in Groningen in the Netherlands.

The results, based on a self-assessment by national experts,show that the spread of carbapenem-resistant infections, including those caused by *Klebsiella pneumoniae*, is much wider across Europe than what we saw on the previous slide on bloodstream infections.

When also other infections, such as respiratory and urinary tract infections, are considered, almost all countries have reported cases.

And many of these countries have reported regional spread, inter-regional spread, or even an endemic situation.



I would also like to speak about a new serious concern highlighted in this survey; the emergence and spread of carbapenem-resistant *Acinetobacter baumannii* infections, so-called CRAb infections.

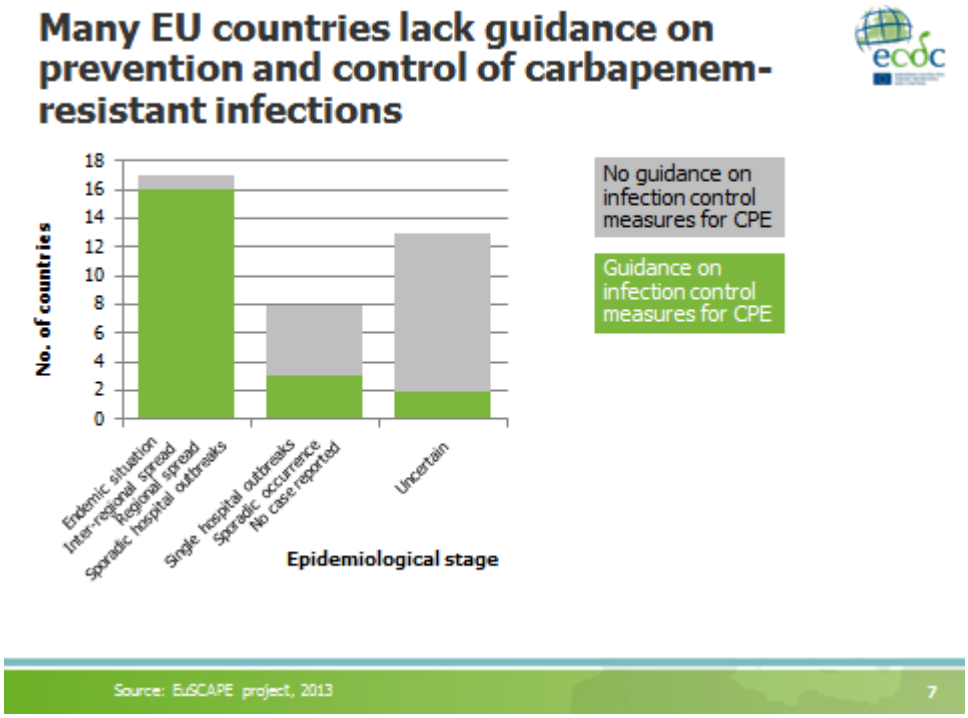
CRAb is responsible for healthcare-associated infections, in particular for ventilator-associated pneumonia and urinary tract infections.

The percentage of CRAb was above 80% in 3 countries (Greece, Italy and Romania) out of the 18 countries that reported on this particular infection. So CRAb infections may indeed be the next challenge for hospitals in many European countries.

As part of this survey, experts also reported on the availability of national guidance documents for the control of carbapenem-resistant infections. Results show that 17 of the 38 reporting countries still lack national guidance documents

Most of the countries that report hospital outbreaks, regional or inter-regional spread or even an endemic situation (*on the left of this slide*) already have such national guidance in place.

However, in countries that report single hospital outbreaks, sporadic occurrence or no cases (*the middle column*), and in countries that are uncertain about their situation for carbapenem-resistant infections (*on the right*), there is a much smaller proportion of countries with such guidance.



My message is, therefore, that there is an urgent need for all European countries to have in place national guidance documents!

National guidance documents are key so that hospitals that are faced with these type of infections can take action to control the spread and minimise the impact of outbreaks carbapenem-resistant infections.

Failure to contain highly resistant bacteria (*such as the ones that I just mentioned*) would mean the end of modern medicine as we know it.

Common procedures such as the ones listed here:

- Hip/knee replacement
- Organ transplant
- Cancer chemotherapy
- Intensive care

would not be possible without effective antibiotics.

If not controlled highly-resistant bacteria are indeed a threat not only to the safety of hospital patients, but to our societies in general.

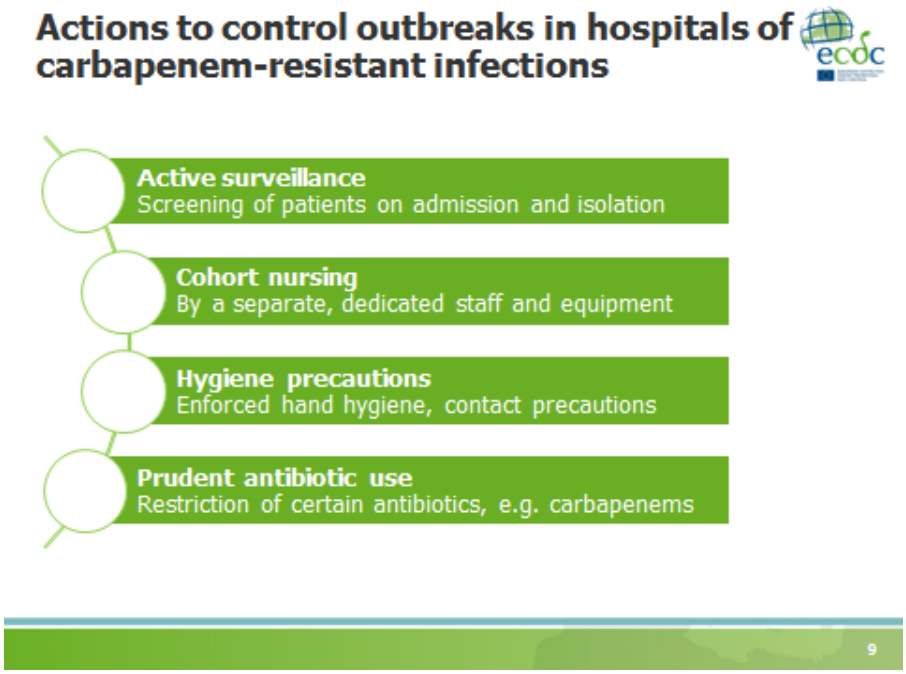
Even the World Economic Forum acknowledges the spread of highly-resistant bacteria as a potential risk for the world's economy.

I would now like to give you 2 examples of outbreaks of carbapenem-resistant infections.

The first example relates to a patient infected with CRAb who was transferred from outside the EU to the intensive care unit of a French hospital. This is a hospital that implements strict measures on surveillance in order to detect and screen repatriated patients on admission and to isolate patients that are found positive for carbapenem-resistant bacteria.

The CRAb infection of this patient was therefore detected on admission. But despite these measures, 5 additional patients were infected by CRAb.

Cohort nursing by a separate dedicated staff and equipment, enforced hygiene precautions and prudent use of antibiotics could have further reduced the spread.



The second example relates to a large scale hospital-wide outbreak of carbapenem-resistant *Klebsiella pneumoniae* in Israel.

Given that the hospital already had an outbreak situation when the measures were implemented, a multifaceted strategy needed to be applied over 3 years to bring the situation under control.

The strategy was based on 5 key elements;

1. an emergency department flagging system;
2. the building of a cohort ward;
3. the eradication of clusters;
4. environmental and personnel hand cultures/samples;
5. and a carbapenem-restriction policy.

As a result, the rate of carbapenem-resistant *Klebsiella pneumoniae* infections decreased by more than 10-fold in this hospital. And no further such healthcare-associated infections have since been diagnosed there.

In 2011, ECDC provided guidance in a risk assessment on the spread of carbapenem-resistant infections through patient transfer between healthcare facilities, looking in particular at cross-border transfer of patients.

Together with infection control measures, improving antibiotic use is the most important action needed to slow down the very worrying development and spread of antibiotic-resistant bacteria.

Antibiotics are frequently used inappropriately, or when they are not needed, not only in humans but also in animals.

The European Commission advocates for the *'One health'* aspect in order to tackle AMR and, the Commission launched an '*Action Plan against the rising threats from Antimicrobial Resistance' back in 2011* that embraces this holistic approach.

We need healthy animals in order to have healthy humans

But equally important, prudent use of antibiotics is crucial, not only in humans but also in animals!

In 2013, the European Medicines Agency (EMA) published the third report on its European Surveillance of Veterinary Antimicrobial Consumption (ESVAC).

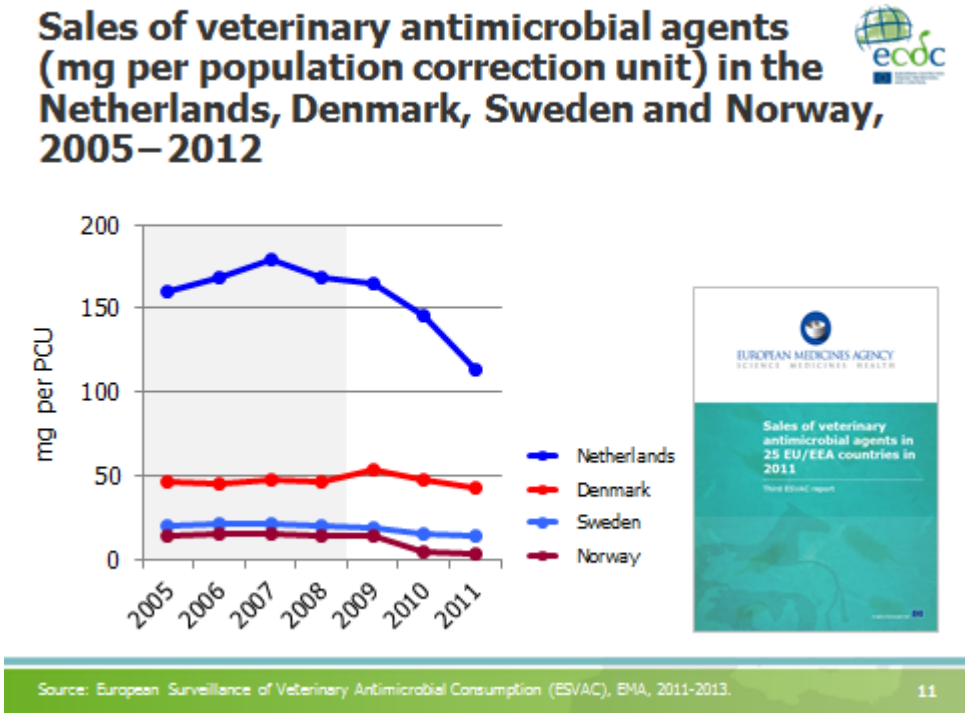
Data on the sales of veterinary antibiotics from 25 European countries were presented, 4 of which we have selected for this slide.

These results confirmed that there were large variations depending on the country, with a very high consumption in the countries at the top of the graph, such as the Netherlands, to a much lower consumption in the countries at the bottom of the graph, such as Sweden or Norway.

However there is also promising news, in the Netherlands *(illustrated on this slide as a high consumption country)* the most recent data indicate that consumption of antibiotics in animals is decreasing in this country.

So it is indeed possible to take action and to turn the tide.

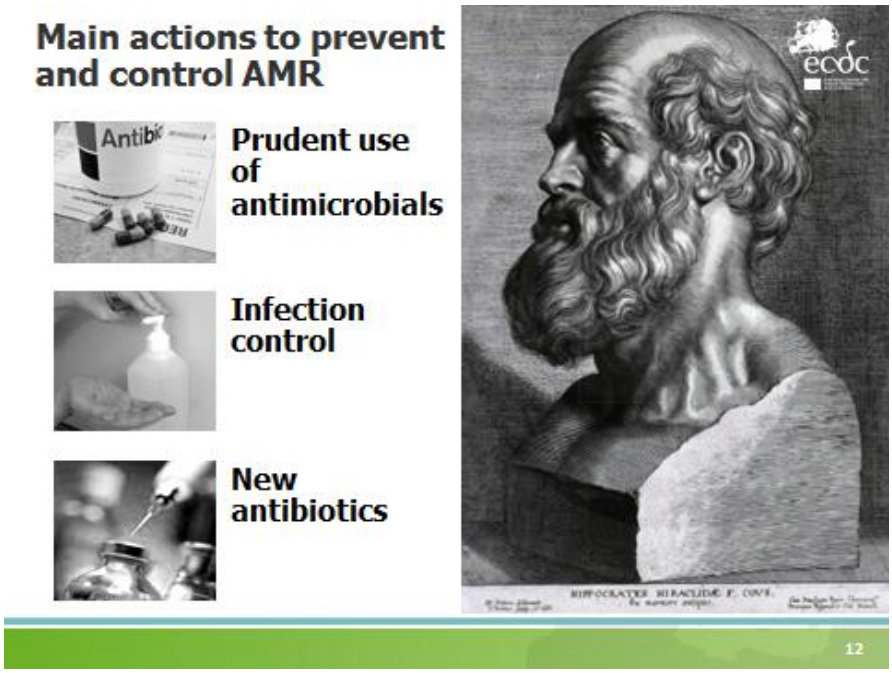
We also have the example of the declining trend of MRSA in humans, that we saw in one of my first slides, to illustrate that it is possible to turn a negative trend.



So what actions need to be taken to ensure that no further harm is done?

I am here referring to the oath of Hippocrates to 'never do harm to anyone' and that I fear is sometimes forgotten today, at least when we look at antibiotics and how they are prescribed.

1. Firstly, prudent use of antibiotics;Take them only when needed and only with the correct dose, dose intervals and duration. And only upon prescription.
2. Secondly, resistance to antibiotics will not be brought under control without paying attention to infection control practices, and especially to hand hygiene in healthcare settings.
3. Finally, we would also need to develop new antibiotics.



And to promote the idea of prudent use of antibiotics, the European Antibiotic Awareness Day was established in 2008.

During the week around 18 November every year, activities promoting prudent use of antibiotics are organised in more than 40 countries across Europe, including all EU member states.

ECDC is also cooperating with its partners in other regions of the world, such as in the US, Canada and Australia.

Cooperating together to tackle the threat of AMR is essential.

And we must not forget that in order to reduce consumption of antibiotics, to advocate prudent use and to fight antimicrobial resistance, we are all responsible - patients, parents, doctors, all healthcare personnel, veterinarians, farmers, policy makers… you and me!

Thank you!