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Essential to tackling AMR **P6**

# Antibiotic resistance

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**Dr Robert Cunney**  
Combatting antibiotic  
resistance within the  
hospital setting



For over 80 years, MSD has been engaged in the fight against infectious disease.

We have sustained a focus in research and development to treat infections caused by antibiotic-resistant pathogens.

United by a common goal, together we can make the crucial difference.



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Dr Dearbháile Morris, lecturer in Bacteriology at NUI, discusses the promise of whole genome sequencing

# We must act now to tackle antibiotic resistance

Antibiotic resistance, or antimicrobial resistance (AMR), is not a mystery, nor a new problem. Alexander Fleming, the discoverer of penicillin, stated in 1945: “There is the danger that the ignorant man may easily under dose himself and by exposing his microbes to non-lethal quantities of the drug, make them resistant”

**T**oday we know that the emergence of AMR is a real and growing public health crisis. It is a natural biological phenomenon, but significantly driven by the misuse and over-use of antibiotics, poor infection control and hygiene practices. The problem is further compounded by international trade and travel and the increasing difficulty and cost of developing new antimicrobial

agents. Over 70 years after Fleming’s warning, we are in danger of entering what Dr Margaret Chan, Director General of the WHO, has termed the “post antibiotic era”. This is an era in which the developments of modern medicine are at risk and simple infections once again become killer diseases.

We must act now, however a great deal has already been done. The control of healthcare associated infections and AMR has been a policy priority for the Department of Health and the health system for

**Dr Tony Holohan**

Chief medical officer, Department of Health

numerous years and a wide range of initiatives has been put in place including improved surveillance of infections and prescribing, infection prevention and control processes, antimicrobial stewardship initiatives, public and professional awareness raising and a significant emphasis on the education and training of healthcare professionals. In addition, in recognition of the requirement for a ‘whole of Government’ approach to health issues, I established, with my colleague the Chief Veterinary Officer, a high

level National Interdepartmental AMR Consultative Committee to provide expert guidance. As well as work on enhancing surveillance between the health and agriculture sectors, the Committee is currently working to develop Ireland’s National Action Plan against AMR which we will publish mid-2017.

This informative publication showcases just some of the ongoing work in Ireland to tackle AMR and, I hope, reminds us of the human ingenuity we possess when addressing challenges for our future health. ■

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## Irish Society of Clinical Microbiologists

The Irish Society of Clinical Microbiologists is an organisation with over 40 years experience in diagnosis, treatment and prevention of infection. We are passionate about controlling the spread of resistant bacteria and other microbes in Ireland.

Antimicrobial resistance (AMR) is a real threat to modern medicine and human health.

Clinical Microbiologists believe that sustaining treatment for infections in current and future generations requires urgent intervention by government, healthcare professionals, industry and Irish society in general.

In these interesting times there are many challenges...with firm action now AMR can be contained.

<http://www.iscm.ie/website/>

# The role of the medical scientist in combatting AMR

Lisa Rose, Senior Medical Scientist and Chair of the Microbiology Advisory Body of the Academy of Clinical Science and Laboratory Medicine, discusses current threats from antibiotic-resistant bacteria – and the importance of the diagnostic laboratory in combatting such threats

By Ben Murnane

“Bacteria are clever organisms!” says Rose. “They multiply very quickly, and naturally have ways of adapting and evolving in their environment – and one of these ways is they develop resistance to antibiotics, in order to be able to multiply in the presence of antibiotics.”

When bacteria that have developed resistance multiply, this can result in an infection that is not treatable by antibiotics. Thus, antibiotic resistance, or antimicrobial resistance (AMR), poses a major threat to public health.

The diagnostic laboratory plays a key role in helping humans to be ‘clever’ in combatting these ‘clever bacteria’!

“AMR poses a very particular challenge for those of us working in diagnostic microbiology laboratories,” says Rose. “On a daily basis we’re trying to decipher extremely

complex test results, and we’re trying to detect novel and emerging resistant organisms.

“I feel that laboratory scientists can play an essential role in the early detection of AMR. There’s an increasingly high level of expertise needed now for the complex challenges we’re facing. We need more rapid tests, and laboratories have the ability to design these rapid tests and implement them, and the expertise to decipher the complex antibiotic profiles which determine the underlying resistance mechanisms. All of this helps clinicians in prescribing proper treatments and implementing infection prevention and control strategies.

“An example of a challenge at the moment is the recent outbreak of CRE in a Dublin hospital, and the ongoing outbreak of CRE in other hospitals around the country. We also face a challenge with gonorrhoea, which is now regarded as a superbug due to the fact that it has



**Lisa Rose**

Senior Medical Scientist and Chair, Microbiology Advisory Body of the Academy of Clinical Science and Laboratory Medicine

PHOTO: TOMMY CLANCY

developed resistance to last-line-of-defence antibiotics. There’s been about a seven-fold increase in the development of gonorrhoea cases in Ireland, in the decade up to 2013. There is a need for a national bacterial STI reference laboratory to monitor the worrying trend of antibiotic resistance in gonorrhoea.

“The laboratory plays a key role in the detection of resistant superbugs and infection prevention and control to stop the spread of bacteria.

“Currently we have a wide range of tests, all of which follow national and international best practice. We utilise various methods for detecting AMR, some of which have been in existence for a number of years. Some are more complex and more novel, such as using molecular methods for the detection of the actual resistant gene.

“Increasingly we are relying on these more rapid gene tests, because we can get results in one

or two hours. That can have a huge impact on patient care and preventing the spread of these resistant bacteria. If we can tell clinicians that in a particular hospital there is a resistance organism that could be transmitted to other patients, they know that they can isolate the patient with the infection immediately.”

Diagnostic testing also helps guide treatment. “When we know whether a bacterium is resistant to a particular antibiotic, that can guide the clinician in their course of treatment.”

In terms of the role of the laboratory in combatting AMR into the future, Rose says: “The new rapid diagnostic tests are an essential part of combatting AMR. Resources from the government are vital, to enable medical scientists to implement rapid diagnostic tests on a national basis and to facilitate surveillance scientists in detecting emerging resistance.” ■



## The Academy of Clinical Science and Laboratory Medicine

“Supporting excellence in Clinical Science and Laboratory Medicine, and in doing so, enhancing patient outcomes”



**Dr. Irene Regan**  
President, ACSLM

*“Ag tacú le sármhaitheas san Eolaíocht Chliniciúil agus an Leighis Saotharlainne, agus é sin á dhéanamh, torthaí othar a fheabhsú”*

The ACSLM is the professional body for Medical Scientists and professionals working in Clinical Science and Laboratory Medicine in Ireland.

The vision of the ACSLM is “To support excellence in clinical science and laboratory medicine, and in doing so, enhance patient outcomes”.

Laboratory Medicine is a clinical service and the clinical sciences that underpin laboratory medicine are; Cellular Pathology, Clinical Chemistry, Haematology, Immunology, Medical Microbiology, Molecular Diagnostics, POCT, Transfusion and Transplantation Science and Virology. The list continues to grow and it is the members of the ACSLM who are at the forefront not only in the provision of these services but in the management and delivery of the services.

### Medical Scientists

The ACSLM is the professional body for Medical Scientists and professionals working in Clinical Science and Laboratory Medicine in Ireland.

There are approximately 2,000 Medical Scientists working in Ireland with up to 70% of the profession qualified to MSc. level and beyond. With a much quoted 70% of diagnoses relying on Laboratory Medicine, the ACSLM endeavours to ensure that the specialty is at the forefront of the innovation and leadership that is required to deliver our vision. The ACSLM has a philosophy of life-long learning and our Medical Scientists participate in CPD and continue to achieve qualifications which include FRCPath, MBA, Masters in IT, Quality and Training & Education.

Medical Scientists’ roles in the Irish healthcare system have developed in tandem with the developments in the health sector and scientific discovery. Medical Scientists have lead roles in areas such as molecular diagnostics, medical genetics, clinical trials and R & D.

There are many Medical Scientists, respected as experts in their field, ideally positioned to move to a higher level of practice to improve the patient/client journey. In the challenging environment facing health care providers, the development of recognised advanced practice for Medical Scientists can bring benefits to the service user and providers in terms of improved access to appropriate healthcare in a timely manner, reduced waiting lists, reducing unnecessary clinical care costs and freeing up other healthcare professionals to focus on the patients, clients and service users who most need their care.

INSPIRATION



MYTH BUSTING

## 5 myths about antibiotics

- 1 **MYTH** Antibiotics make you get better faster from viral infections, such as colds and flu.  
**FACT** Antibiotics are designed to kill bacteria. They have no effect on viruses which cause colds and flu.
- 2 **MYTH** Antibiotics will reduce a temperature.  
**FACT** Antibiotics have no effect on your temperature. To reduce pain, consider a painkiller, such as paracetamol or ibuprofen.
- 3 **MYTH** Only people who use antibiotics regularly are at risk of antibiotic resistant infections.  
**FACT** Unfortunately, anyone can develop antibiotic resistant infections, not just those who use antibiotics regularly.
- 4 **MYTH** You don't have to take all the antibiotics prescribed – it's ok to stop when you feel better  
**FACT** You must complete your course of antibiotic, even if you are feeling better. Stopping the course before its completion will actually increase your chances of bacteria developing resistance.
- 5 **MYTH** There is nothing you can do to reduce your risk of getting an antibiotic resistant infection.  
**FACT** There is a lot you can do to reduce your risk: only use antibiotics when needed, always take antibiotics exactly as prescribed, get immunised and practice good and hygiene

 Read more on [www.healthnews.ie](http://www.healthnews.ie)

# Do you really need that antibiotic?

Dr Nuala O'Connor, ICGP lead adviser on Antibiotic resistance, talks about why antibiotics are under threat and what we can do to help keep them effective for future generations

By Dr Nuala O'Connor

Antibiotics have utterly transformed modern medicine. Before antibiotics were available, common injuries such as cuts and scratches that became infected could result in death or serious illness because there was no treatment available. The evidence is very clear – overuse and misuse of antibiotics has allowed bacteria to develop resistance and they are becoming immune to the drugs we use to defend ourselves. It is estimated that in 2015, 25,000 people died in Europe from resistant infections. That is one person dying every 10 minutes. If we continue to misuse antibiotics and do not develop new ones, the UK Analysis by Lord Jim O'Neill predicts that by 2050, 10 million deaths worldwide will be attributable to antibiotic resistant infections.

Much of what we take for granted in modern medicine could not happen without antibiotics, for example hip replacements, cancer operations and treatments, kidney transplants and cardiac surgery. If we return to the pre-antibiotic era, common infections such as pneumonia, kidney infections or skin infections will result in death because there will be no effective antibiotics to treat them.

Global international and Irish experts agree that everyone has an important role to play in ensuring correct use of antibiotics, and tackling the global health threat of antibiotic resistance.

There is action required at many levels. The World Health Organisation, United Nations and governments around the world have launched campaigns, adopted resolutions and funded programmes to fight antibiotic resistance. Antibiotics

are not just used in humans, but also in animals and in agriculture.

At the end of the day, each professional who prescribes antibiotics or influences the decision to prescribe them must take personal responsibility to ensure that it was necessary.

### So what can Irish patients and doctors do to help?

Ireland has a relatively high level of antibiotic resistance compared to most European countries, and the Irish population uses a lot more antibiotics than many European counterparts – especially northern European countries. Irish patients are prescribed twice as many antibiotics as Scottish patients and 5 times more than Swedish.

### Why do we use so many antibiotics in Ireland?

Antibiotics are very specific



If you take antibiotics when you don't need them you run the risk of carrying antibiotic resistant bacteria in your gut. If these bacteria go on to cause an infection, antibiotics may not work when you **really** need them

 **ANTIBIOTIC GUARDIAN**  
[www.antibioticguardian.com](http://www.antibioticguardian.com)

**Global international and Irish experts agree that** everyone has an important role to play in ensuring correct use of antibiotics



PHOTO: THINKSTOCK

medicines designed to kill bacteria. They are “magic bullets” for bacterial infections, but most common infections are viral. Antibiotics do not kill viruses. Antibiotics will not make your cold, cough, flu, diarrhoea, earache or other illness like this better. Antibiotics will not reduce a fever. They will not relieve pain. However, many patients think antibiotics will help them get better faster from illnesses such as these.

Winter antibiotic public awareness campaigns promoting self-care for self-limiting viral infections such as underthweather.ie are helping to address this problem, but all doctors must support this by stopping to prescribe antibiotics unless there is a reasonable clinical certainty that the patient has a bacterial infection.

The best way to treat most colds, coughs or sore throats is to drink plenty of fluids and get some rest. Take

paracetamol or ibuprofen to relieve headache, aches and pains and fever, and ask your pharmacist for advice about other over-the-counter remedies.

If you are concerned about yourself, your child or a loved one, it is important to get your GP to examine them to exclude more serious bacterial infections which could require antibiotics.

Don't forget about the importance of washing your hands to prevent the spread of infections. Make sure you get all the recommended immunisations for your children, and the flu and pneumonia vaccine if you are over 65 or have a chronic medical condition.

**Most people do not realise that antibiotics can be harmful. What does an antibiotic do to me if I take it when I don't need it?**

If you take antibiotics when you don't need them it can make



**Dr Nuala O'Connor**

ICGP lead adviser on antibiotic resistance

bacteria resistant to them. This means that they may not work to make you better when you really need them for another bacterial illness such as a kidney infection, pneumonia or meningitis.

Taking antibiotics may also give you nasty side effects – rashes, upset stomach, diarrhoea or serious allergic reactions which can be life threatening.

**If I get an antibiotic do I need to take them all?**

If the doctor prescribes an antibiotic for you, make sure you take them exactly as prescribed. Even if you feel better after taking some of them, you need to take them all. If you don't, some bacteria may be left in your body and can become resistant to antibiotics.

Don't keep or reuse left-over antibiotics for the next time you, your child, or any other family member is sick.

**Does the doctor always prescribe the same antibiotic?**

Doctors follow national guidelines when prescribing the best antibiotic to use for different bacterial infections. We need to use effective, safe narrow-spectrum antibiotics where possible and keep the stronger, broad-spectrum antibiotics for more serious infections. Many people mistakenly think they are allergic to penicillin, however true penicillin allergy is uncommon and I would advise patients to check this with their GP.

By using the correct antibiotic to cure your infection, it will be more effective, reduce side effects and will help bacteria not to become resistant to antibiotics.

**Keeping antibiotics effective for future generations is everyone's responsibility. ■**



Read more on [www.healthnews.ie](http://www.healthnews.ie)



193 countries have now signed a landmark declaration agreeing to combat antimicrobial resistance

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INSPIRATION



EXPERT TIPS



Dr Susan Knowles

Consultant microbiologist, National Maternity Hospital, Dublin and President, ISCM

## Right prescription, right patient

**D**r Susan Knowles, consultant microbiologist at the National Maternity Hospital, Dublin and President of Irish Society of Clinical Microbiologists (ISCM) speaks about the importance of education around AMR

“It’s vital for the public to be aware that antibiotics have no effect on viral infections, such as colds and flus, to avoid unnecessary antibiotic prescriptions,” says Susan. “However, hospitals are more susceptible to AMR, as this is where sicker patients are.

“Antimicrobial stewardship in hospitals is essential. It’s about following guidelines and ensuring that when antibiotics are given to patients, they’re prescribed appropriately. Doctors or nurses should follow the ‘Start Smart, Then Focus’ care bundle. After 24-48 hours, patients should be reviewed and a decision should be made as to whether the patient should stop, switch or continue taking an antibiotic.

“Surgery also contributes to AMR, so WHO (World Health Organisation) have guidelines which state antibiotics should only be used immediately before and during surgery, not afterwards, to prevent infection.

“There is always room for more support for healthcare professionals in terms of antibiotic prescribing – we need regular reminders and new ways of spreading information. It’s an area of huge concern internationally, for WHO and governments worldwide, so it’s important we keep education and awareness alive.” ■



Dr Kirsten Schaffer

Consultant Microbiologist at St Vincent’s University Hospital and Chairperson, ISCM sub-group of infection prevention and control

## Plan to change

**D**r Kirsten Schaffer, Consultant Microbiologist at St Vincent’s University Hospital and Chairperson of the ISCM sub-group of infection prevention and control, on why a national action plan needs to be put in place to tackle AMR

“The rate of resistant bacteria outbreaks in hospitals has been increasing. If a national plan is not developed urgently, there are concerns that we won’t be able to contain AMR. The national plan needs to look at several interventions. In addition to antimicrobial stewardship and hand hygiene promotion, we must look at our hospital facilities. Some hospitals may have 15 patients in one room sharing one toilet and one sink, which makes control of resistance impossible.

“In addition we have to look at our lab capacities and healthcare staffing in general. The Irish government needs to address the deficits that prevent hospitals from implementing the National Guidelines for the control of MDRO (multi-drug resistant organisms).

“AMR affects everyone and all aspects of modern medicine so I think if we really want a change, we need to start in our hospitals and community – it needs engagement by everybody; the government, industry, and healthcare workers, or otherwise we won’t win the battle.” ■

# Combating antibiotic resistance in the hospital setting

By Ben Murnane

**No area will be more affected by antibiotic resistance than hospital services themselves. Dr Robert Cunney talks about antimicrobial stewardship and surveillance within the hospital setting.**

Antibiotic resistance and healthcare associated infections (HCAIs) are often thought of as two separate issues, but they are very much interlinked, according to Dr Robert Cunney, Consultant Microbiologist at Temple Street Children’s University Hospital, Dublin, and Clinical Lead for the RCPI/HSE Clinical Programme for healthcare associated infections and antimicrobial resistance (AMR). “Bacteria take only about 20 minutes to create a new generation,” explains Cunney. “And they can very easily share the genetic markers for resistance. If these bacteria get introduced to hospitals, where you have lots of sick people in close proximity, there is much potential for infection.”

The elements involved in combatting AMR and HCAIs include good antibiotic stewardship – making sure antibiotics are prescribed and taken correctly – but also taking steps to prevent infection in the first place. The fewer infections, the less need for antibiotics, and of course overuse of antibiotics is one of the main reasons some bacteria are now resistant.

“By vaccinating our healthcare workers it makes it less likely that a child who comes into Temple Street will pick up flu, for instance, and therefore less likely to get the bacterial infections that can sometimes happen after flu and require antibiotics.



Dr Robert Cunney

Consultant microbiologist, Health protection surveillance centre and Temple street Children’s university hospital, Dublin

“A lot of HCAIs are linked to the invasive devices used in healthcare, like intravenous lines or urinary catheters. One of the best ways to reduce need for antibiotics is to manage those devices appropriately. And that may be just a matter of getting the device out as soon as it’s no longer needed.”

Preventing transmission once someone becomes infected is also vital. “This is where things like hand hygiene and environmental hygiene and our isolation precautions come into play.”

### Start Smart

In terms of the role of proper prescribing of antibiotics, to ensure they are not used inappropriately – thereby reducing our dependence on them and reducing the likelihood that bacteria will develop resistance – Temple Street has had great success with a programme called Start Smart.

Cunney and a colleague, Clinical Pharmacist Michelle Kirrane, headed an initiative to raise compliance with antibiotic prescribing guidelines for children admitted via the Emergency Department. From January to March last year, the pair, working with disciplines across

the hospital, were able to raise compliance from 30 per cent to 100 per cent, where it has stayed ever since. Ten hospitals around the country are now using the same Start Smart approach.

“We took an approach called ‘frontline ownership’: getting the people who are actually prescribing antibiotics to take ownership of the problem, and come up with solutions,” explains Cunney. “We measured how well people were following the guidelines, and then fed that information back to them. That started to get people engaged – realising this is actually our prescribing habits we’re looking at.”

Some new elements that were introduced, based on ideas from frontline staff, included making updates to prescribing guidelines more easily available, guideline summary cards attached to ID badges, and guideline summaries at the point of prescribing.

Cunney says that when it comes to good antibiotic stewardship, there are two key change agents. “Often if somebody is prescribing antibiotics, they’re not aware that they’re contributing to an overall level of antibiotic resistance. So having good data that you can show is critical. The other critical thing is social engagement. ‘Command and control’ approaches don’t work. It’s about sitting down with people and exploring why they’re overusing antibiotics, and understanding the local system around prescribing.”

There is no more important challenge facing healthcare today, says Cunney. “It’s an absolute necessity to have good antibiotic stewardship, so that we can hopefully reverse some forms of antibiotic resistance, and slow others down.” ■

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## EXPERT TIPS



**Dr Fidelma Fitzpatrick**

Senior Lecturer, RCSI and Consultant Microbiologist, Beaumont Hospital, Dublin, Ireland

## Know your superbugs

A superbug is a bug or bacteria that certain antibiotics won't kill. It makes sense for a bacteria to evolve into a superbug in order for it to survive and live. As a doctor, when I go to see patients, I'll usually have a full choice of antibiotics that work against an infection, both tablet and drip antibiotics. But if you have a superbug infection, I have far fewer antibiotics to choose from. Generally with a superbug infection, a drip antibiotic will be needed. I still thankfully have never seen a superbug that no antibiotics will work against. But, if antibiotic resistance continues to develop, this is a distinct prospect. So, a superbug is not yet untreatable, but it's much more difficult to treat because there are limited antibiotics to use against it. Superbugs can generally be divided into those that live on the skin and those that live in the bowel. Of the skin superbugs, the most commonly known is MRSA, which stands for methicillin-resistant Staphylococcus aureus. "Staph aureus" is a common germ that is often found on the skin and in the nose of healthy people; so, MRSA is a type of Staph aureus that has become resistant to treatment with a number of different antibiotics. Your bowel is full of billions of bacteria, and it's a prime environment for bugs to combine and exchange genetic material. One of the bowel bugs is VRE (vancomycin-resistant Enterococci). Mostly, VRE lives harmlessly in the bowel, but it can cause infection in, for example, intensive care patients – and this infection will be resistant to many common antibiotics. This is the case for other bowel bugs as well, for example ESBLs (extended spectrum beta lactamases) or CRE (carbapenem-resistant Enterobacteriaceae). These are some of the most common superbugs you will hear about. ■

For more information go to [www.hspc.ie](http://www.hspc.ie)

# A revolution in diagnostic testing

Dr Dearbháile Morris, Lecturer in Bacteriology at National University of Ireland, Galway, discusses the promise of whole genome sequencing

By Ben Murnane

"One of the strategies to combat the spread of antimicrobial resistance (AMR), or antibiotic resistance, is to develop rapid point of care diagnostic tests, to more quickly distinguish whether a particular infection is caused by a virus or bacteria," explains Morris. "We can then prescribe an appropriate antibiotic if it is a bacterial infection, and avoid inappropriate prescribing of antibiotics for infection caused by viruses."

A recent US study estimated that unnecessary use of antibiotics

led to \$163 million in excess costs to US hospitals over a three-year period. "The cost saved from that alone could support the development of these new point of care tests," says Morris.

There have been a number of innovations in recent years, in terms of the types of diagnostic technologies that are used. But, says Morris, whole genome sequencing, or next generation sequencing, is a technology that is advancing quickly and has the most promise.

"Whole genome sequencing, as the name suggests, is essentially sequencing the entire genome of an organism. The origins of the technology are in trying to examine the human genome. Sequencing a microbial genome, which is a lot smaller, is a lot easier and quicker. So, in recent years, the various technologies involved have advanced greatly. These technologies are not yet available for point of care tests, but in the near future they could prove to be a significant player."

The illustration shows three stylized human figures against a teal background. On the left, a woman with blonde hair has a runny nose and is coughing. In the center, a woman with dark hair has a headache. On the right, a man with brown hair has an earache, a sore throat, and a rash on his neck. A thermometer icon is positioned above the man's head, labeled 'Temperature'. The text 'Feeling unwell' is partially visible on the right side of the illustration.

## Feeling unwell under the weather

Under the Weather is a HSE website that provides advice on how to look after yourself or a child through coughs, colds, rashes, fevers, sore throats and more. It has videos and advice from GPs and other healthcare professionals.



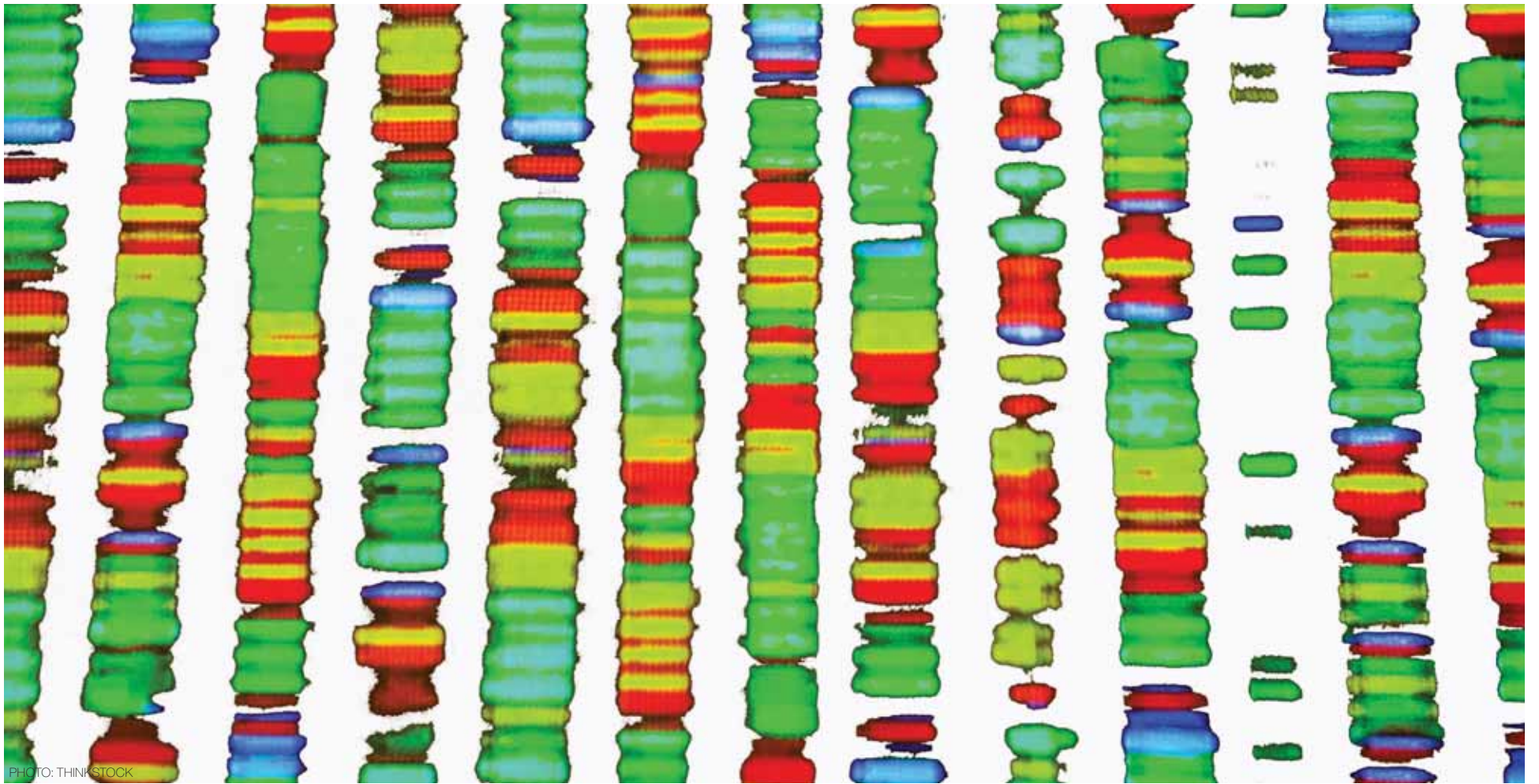


PHOTO: THINKSTOCK

There are challenges, however, in terms of getting clinicians or GPs to actually adopt such tests, when they become available.

“Cost would be one of the major blocks,” says Morris. There is a potential conflict between what might appear cost-effective to the individual doctor treating the patient, and the benefits to society as a whole from reducing antibiotic use.

“When a patient comes into a GP surgery and is suspected of having a certain type of infection, the

doctor will often prescribe an antibiotic empirically, rather than take a sample and wait for lab tests to come back. So an antibiotic is prescribed before it is known for sure whether the cause of the infection is viral or bacterial – or, if it is bacterial, whether the bacteria will be susceptible to that particular antibiotic. However, due to the cost of some of the point of care tests already available, it can be cheaper for the GP to prescribe empirically rather than use the point of care test.



**Dr Dearbháile Morris**

Lecturer in bacteriology at National university of Ireland

“So, I think costs would be a major consideration for clinicians, and they also need to be assured of the accuracy and specificity of the point of care tests – and of their benefit in terms of reducing unnecessary prescribing and hence reducing the impact of AMR.”

Whole genome sequencing is the future, according to Morris. “A lot of work still has to go into developing it, but I think next generation sequencing offers immense opportunities, because it can potentially

tell us in one quick test, in a primary care setting, if bacteria is causing the infection, what species of bacteria, and which antibiotic might be useful in treating it. That’s going to minimise hugely the inappropriate use of antibiotics.” ■

 Read more on [www.healthnews.ie](http://www.healthnews.ie)

# Under the weather?

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...at gives you practical advice on ...ough a common illness such as ...ts, earaches and tummy bugs. ...pharmacists.



PANEL OF EXPERTS

Antibiotic or antimicrobial resistance (AMR) is now a major issue confronting healthcare providers and their patients. The experts talk about effective ways to address AMR in industry, primary care and hospitals

# Tackling antibiotic resistance

**What role does antimicrobial stewardship play in tackling antimicrobial resistance?**



**Dr Nuala O Connor**

ICGP Irish College of General Practitioners Lead advisor on Antibiotic Resistance

**F**or GPs, hospital doctors, and healthcare workers working in community or long-term care facilities, it's about interventions which promote the best type of antibiotic for a particular patient in a particular situation, to ensure the patient's infection is appropriately treated with little side effects or harm, and which contributes least to the growth of antibiotic resistance.

The Guidelines for Antimicrobial Prescribing for Primary Care in Ireland ([antibioticprescribing.ie](http://antibioticprescribing.ie)) will help GPs choose the right dose, the right duration and the right route for the patient and condition they are trying to treat. Another role is to promote immunisation, infection control – such as sneezing into your elbow – and hand hygiene to stop the spread of infection.

**I**t's about ensuring that we only use antibiotics when necessary. It involves educating patients upfront as to when they should expect antibiotics to work – antibiotics don't work against any viruses. Sometimes patients expect to be prescribed antibiotics or feel like the only way to shake a cold is with antibiotics. We need to ensure that we use less and only when we need them – giving the right antibiotic to the right patient. There are already many initiatives on-going throughout the health service to address AMR. For example, work is being done on 'point of care' testing and modern technologies are used by doctors or healthcare professionals to analyse a germ and what antibiotic might best work. We would also welcome large-scale informatics that can map out where germs are becoming resistant to certain antibiotics in different areas as it isn't the same throughout the world or within communities.



**Dr Colm Galligan**

Medical director, MSD

**M**aking sure antibiotics are used in the right way for people and animals who need them, and are not used where they are likely to do more harm than good, is critical to dealing with antimicrobial resistance. Antimicrobial stewardship is one way to do this – but it is of limited value. What is needed is a national system of restrictive prescribing supported by effective clinical governance. Electronic prescribing and monitoring makes this much easier to do. Restrictive prescribing should mean only a limited range of agents are available to most prescribers and other antimicrobials are used only by an infection specialist (microbiologist, infectious disease physician, specialist veterinarian). Those authorised to prescribe these agents need to be part of a system of standardisation and peer review.



**Professor Martin Cormican**

Professor of Bacteriology, School of Medicine, NUI Galway

**What is the role of collaboration and partnership in addressing AMR?**

**Antibiotics are used** in hospitals, long-term care facilities and communities, as well as in animal health and food production – their widespread use is part of the problem as to why antibiotic resistance has developed. Even when Alexander Fleming discovered penicillin, he said that if we're not careful, resistance will develop very quickly. Penicillin was wonderful, but within a very short period of time of usage, antibiotic resistance started to develop and as each new class of antibiotic developed over the years, you start seeing resistance happening. What we're trying to do is look at how we can limit resistance developing and so that's why there is a need for proactive action to assist in strengthening systems to address AMR.

**No one party can fix this.** It requires a collective action from various stakeholders. We need strong government policy all the way through from academic, industry, veterinary, environmental sciences to public health – we all need to address AMR together. At MSD, we believe we have an opportunity and a responsibility to align with anti-microbial stewardship objectives. We are proud of the fact that we have been looking at antibiotics for the last 70 years and we're still investing very heavily in antimicrobials. From an industry point of view, we need to change the business model around how antibiotics are developing. The emphasis should be on the value of a new antibiotic and its usage, to incentivise more companies to invest their resources in developing new antibiotics.

**Collaboration and partnership** are essential. This partnership needs to include local authorities, Environmental Protection Agency, other key actors in the environmental space and also the Food Safety Authority of Ireland and Safer Food. Contamination of the general environment with antimicrobial compounds and with human and animal faeces are components of this problem that are often overlooked. Environmental contamination with faeces leads to human and animal exposure to antimicrobial resistant gut bacteria in drinking water, food and feed and bathing water. We need all partners to engage in action to clean up our act in this regard.

**What needs to take place across all sectors, from an Irish policy perspective?**

**In 2001, I was part** of the National SARI Committee, asked by the Minister for Health to produce a strategy document which firmed up the key elements necessary to have within hospitals, primary care, veterinary care etc, to help tackle AMR in Ireland – this included everything from following national guidelines to having a proper laboratory system and surveillance in order to track the development of AMR. The action plan hasn't been formally updated since 2001. We need an up-to-date action plan. Unfortunately, the experts put together what needs to happen, but they do not have the power to release the funding to implement recommendations. I'm not saying that nothing has been done, but we could be doing much better if we had fully implemented the 2001 strategy.

**The focus should be** on patient outcomes and what the overall stewardship objectives are for antibiotics – essentially, protecting the future health of patients. Rapid diagnostics, investing money in 'point of care testing' for patients and enabling access to the newest technologies is key for helping healthcare professionals identify the germ and prescribe the right antibiotic. We need to incentivise the research and development of antibiotics particularly in risky early stage research. From an MSD perspective, we want to work with all stakeholder groups to ensure access to new antibiotics for patients most in need.

**There needs to be some sense** of urgency at a high political level. Is it surprising that the occasional inter-sectoral meeting (twice a year) and putting this in the Taoiseach's risk register have accomplished almost nothing meaningful? We should have a Department of Health, Department of Education and the Department of Agriculture, Food and the Marine working on this with some real commitment. Perhaps it could be driven by the Department of the Taoiseach (given that this is on the Taoiseach's risk register). Someone at cabinet level should be asking every Friday what concrete action did we take this week about antimicrobial resistance? For most of the last 52 weeks the answer would have been little or nothing. There is every indication that the next 52 weeks will not be much better. But we might have a few meetings and maybe write reports or two.

**ask your  
pharmacist first**



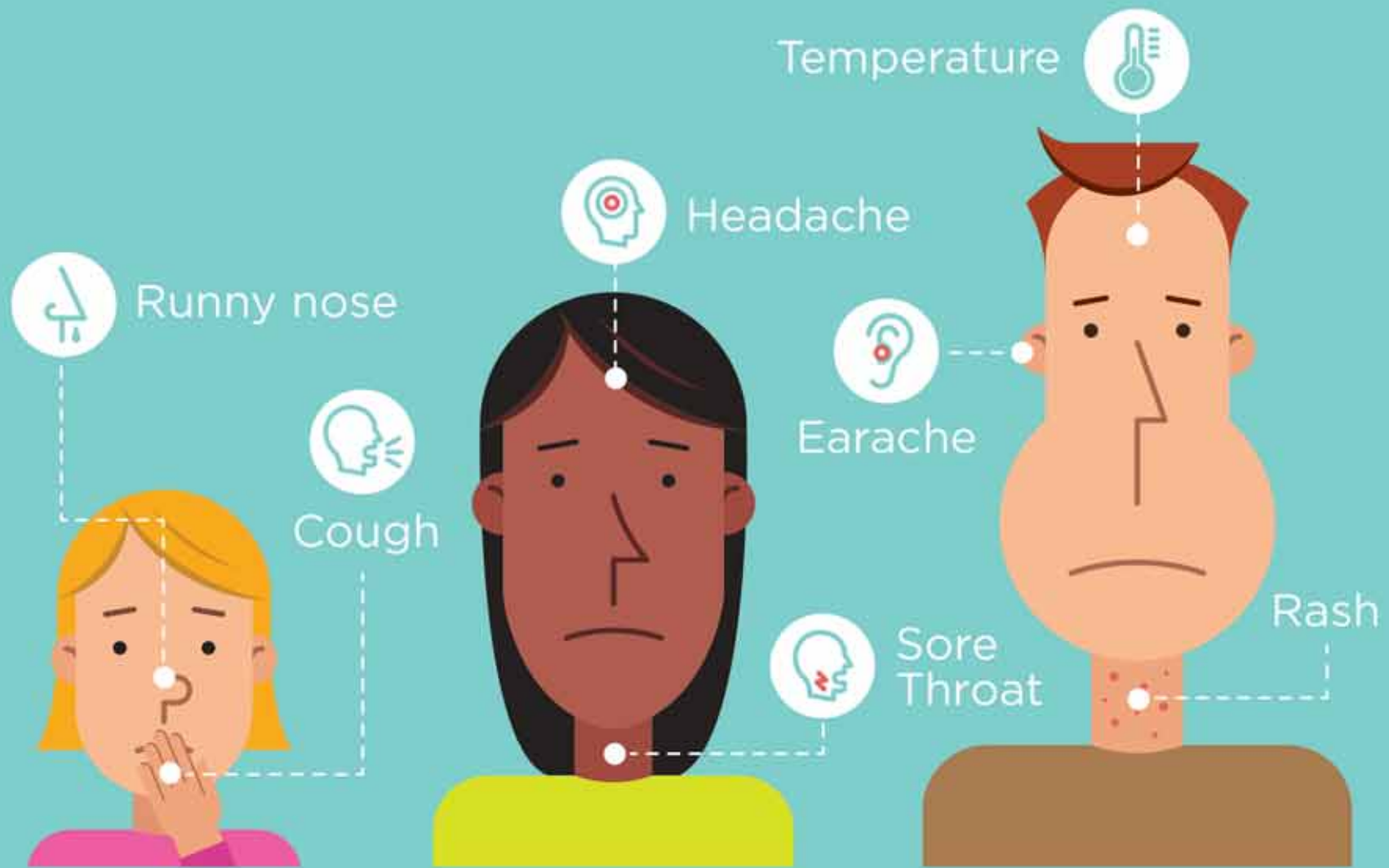
**Your pharmacist is a highly-qualified  
healthcare professional who:**

- Checks your prescription is safe and effective for you
- Can offer you expert advice about your health and medicines
- Provides health services and checks, such as the Flu Vaccination



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# Feeling under the weather?

[undertheweather.ie](http://undertheweather.ie)

Get advice and get better

Under the Weather is a HSE website that gives you practical advice on how to look after yourself or a child through a common illness such as coughs, colds, rashes, fevers, sore throats, earaches and tummy bugs. It has videos and advice from GPs and pharmacists.

