

Introduction to Global-NAMRIP: its aims and objectives

Professor Leighton, FEng FRS

Chair, NAMRIP (Network for Anti-Microbial resistance and Infection Prevention) and Global-NAMRIP

Thanks to:

- **Professor Osman Sankoh:** Executive Director of INDEPTH Network
- The **team** from INDEPTH
- **Dr Martha Gyansa-Lutterodt, Chair of the Ghana AMR Alliance**
Dr Nazarius Mbona Tumwesigye, Makerere University, Uganda
- **Professor Victor Mwapasa, University of Malawi:**
- **Dr Beverly Egyir, University of Ghana**
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- **Dr Don Mathanga, Malaria Alert Centre, Malawi**
- **Dr Kwaku Poku Asante, Mrs Martha Abdulai,**
& Mr Samuel Afari, Kintampo Health Research Centre

- **Yvonne Richardson**
- **Frances Clarke**
- **Mengyang Zhu**

#GlobalNAMRIP2018
#INDEPTHNetwork
#AMR

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#AMR



Welcome!



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Unless a solution is found, by 2050, AntiMicrobial resistance (AMR) will cost the global economy more than the current size of the global economy, and be killing more people than cancer.

Optimism:

- researchers will find something (correctly identifying problem rather than selling solutions);
- drug companies will translate it cost-effectively to 7 billion people, in a manner that will allow ready take-up despite culture, infrastructure, training, behaviour, religion, migration, war, black market, and £100 million racehorses;
- ‘someone’ will keep discovering new drugs and successfully rolling them out to 7 billion people, faster than bugs become resistant to them.

Pessimism: we must live in a world without antibiotics

Practical: we must assume that whilst antimicrobials will be available for the very ill, much of the routine practices that use antimicrobials today need to be replaced by other measures, such as vaccination and infection prevention.

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Science

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The science world is freaking out over this 25-year-old's answer to antibiotic resistance

Could this be the end of superbugs?

FIONA MACDONALD 26 SEP 2016



A 25-year-old student has just come up with a way to fight drug-resistant superbugs *without* antibiotics.

The new approach has so far only been tested in the lab and on mice, but it could offer a potential solution to antibiotic resistance, which is now getting so bad that the United Nations recently declared it a "[fundamental threat](#)" to global health.

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573



A new antibiotic offers a potent weapon against antibiotic-resistant infections.

U.S. Centers for Disease Control and Prevention - Medical Illustrator

Superantibiotic is 25,000 times more potent than its predecessor

By Robert Service | May. 30, 2017, 3:45 PM

From:
First published:
Part of:

Department of Health and Prime Minister's Office, 10 Downing Street
23 October 2015
China

New fund to drive global response to antimicrobial resistance announced during Chinese President Xi Jinping's State Visit.



The UK and China will establish the Global Antimicrobial Research Innovation Fund and encourage further collaboration between governments and the private sector, helping to address the problems facing the world of medicine today.

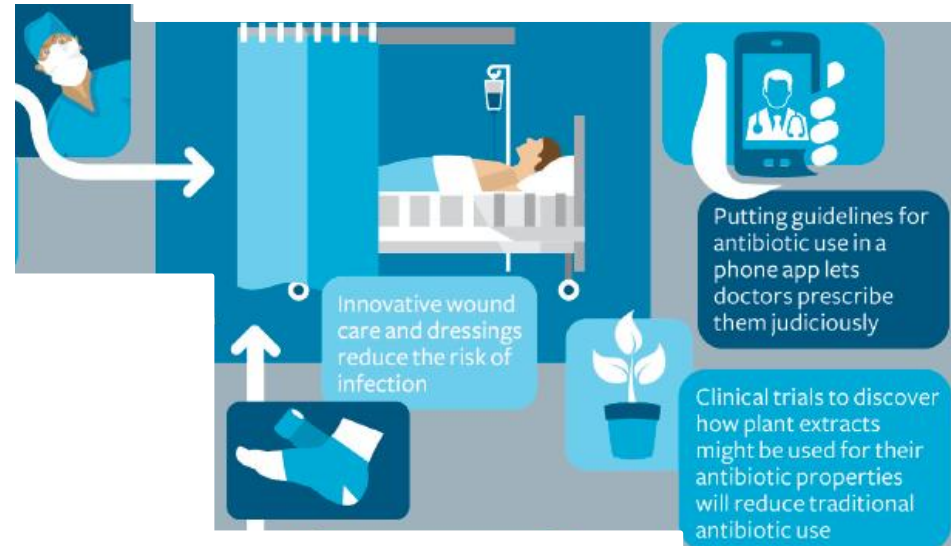
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Innovative minimally invasive procedures reduce infection risk

Instruments made of new materials reduce infection

Lighting innovations reduce infection

Cleaning instruments with new technology could reduce infection

improve antimicrobial stewardship through research to support new policy and governance mechanisms

New microbe resistance surfaces for trays and shelves reduce infection risk

Innovative wound care and dressings reduce the risk of infection

Putting guidelines for antibiotic use in a phone app lets doctors prescribe them judiciously

Clinical trials to discover how plant extracts might be used for their antibiotic properties will reduce traditional antibiotic use

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New inventions ensure tubes in catheters, stents and endoscopes are clean before use.... And by engineering their physical and chemical surface properties we discourage bacterial biofilms growing on them during use

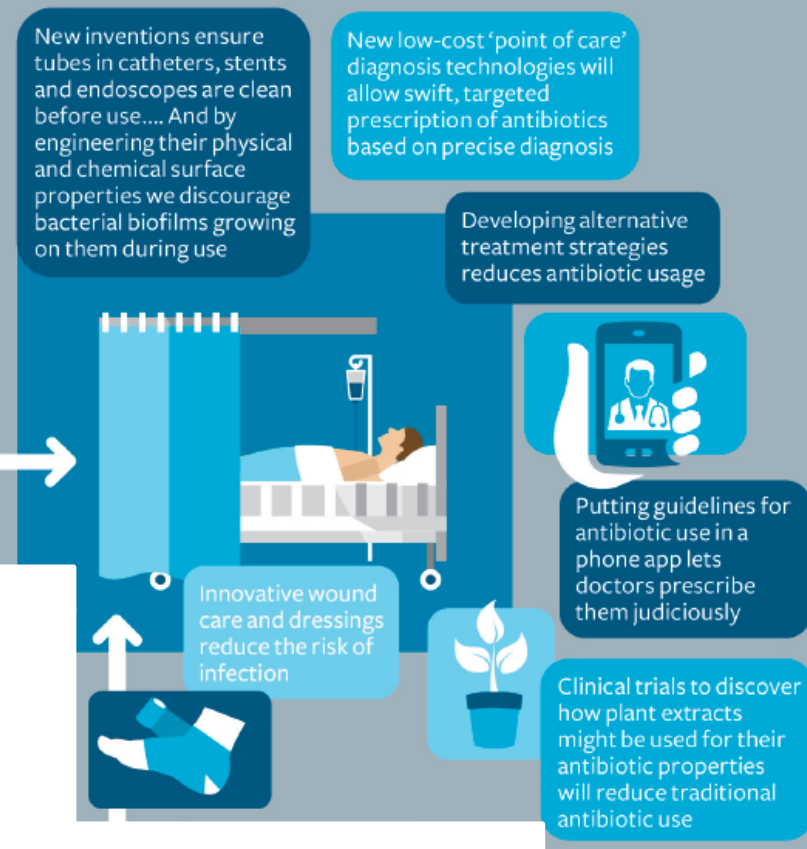
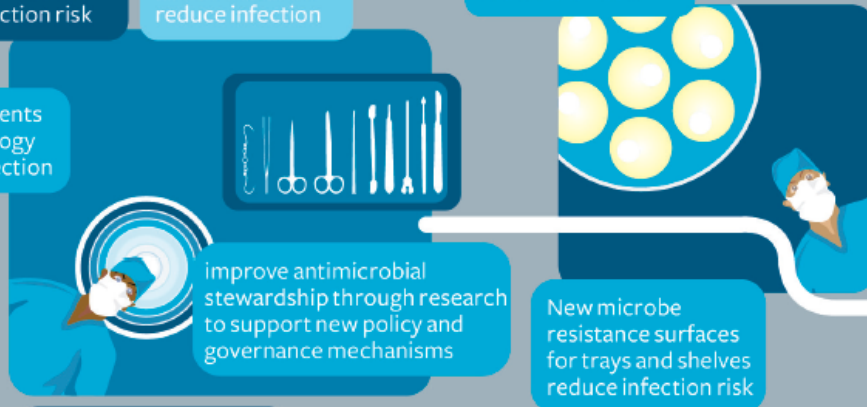
New low-cost 'point of care' diagnosis technologies will allow swift, targeted prescription of antibiotics based on precise diagnosis

Developing alternative treatment strategies reduces antibiotic usage

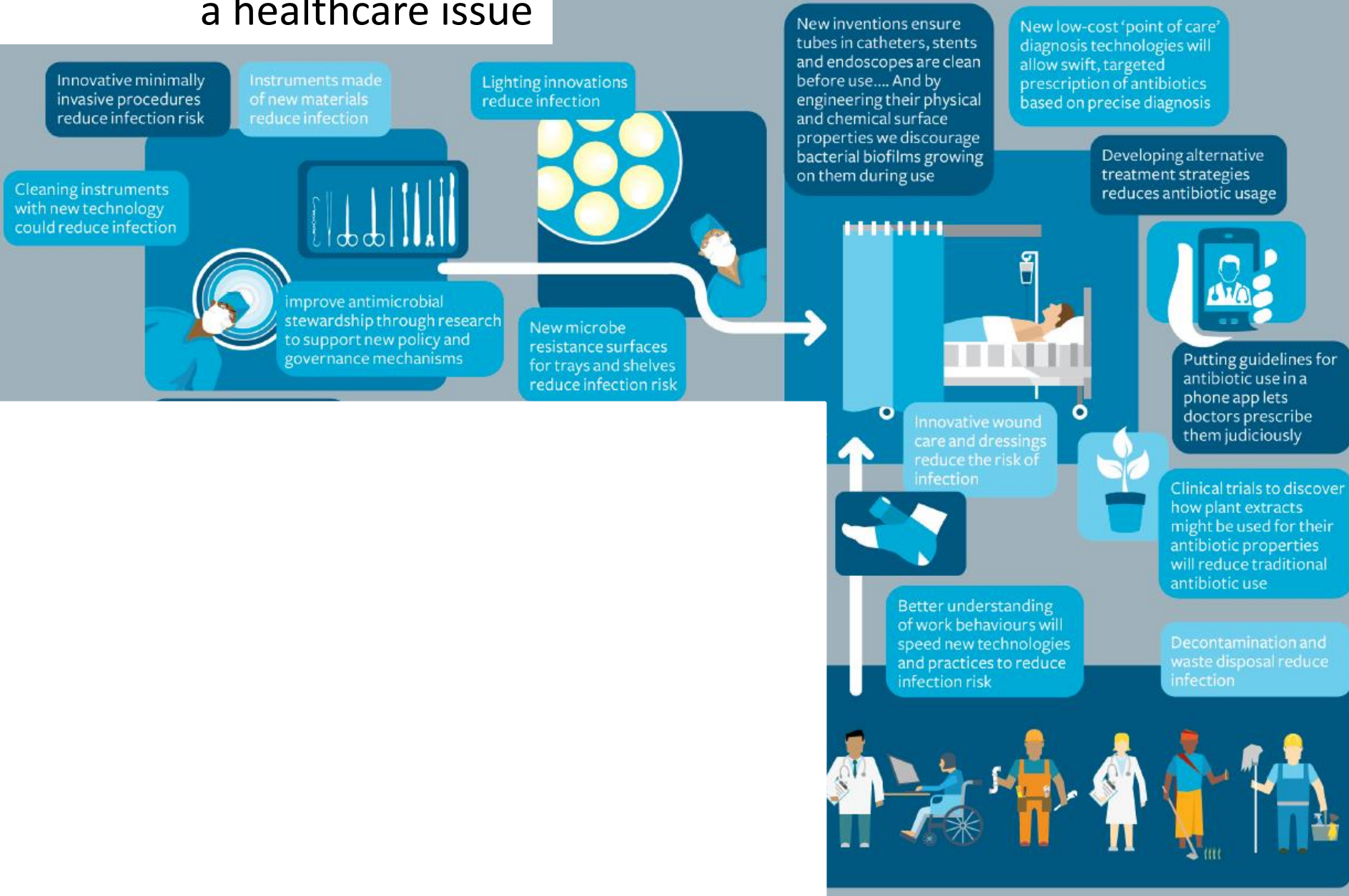
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New microbe resistance surfaces for trays and shelves reduce infection risk

Innovative sensors allow early detection of the contamination that could lead to infection

Understanding how society, climate, land and water resources interact could help manage the risk of microbes moving from one host to another

In the meat industry corporate retail buying power could be used to combat AMR

Employing insights from human nutrition research will hinder bacteria developing antibiotic resistance

New livestock practices reduce antibiotic needs and the risk of resistant microbes evolving

New inventions ensure tubes in catheters, stents and endoscopes are clean before use.... And by engineering their physical and chemical surface properties we discourage bacterial biofilms growing on them during use

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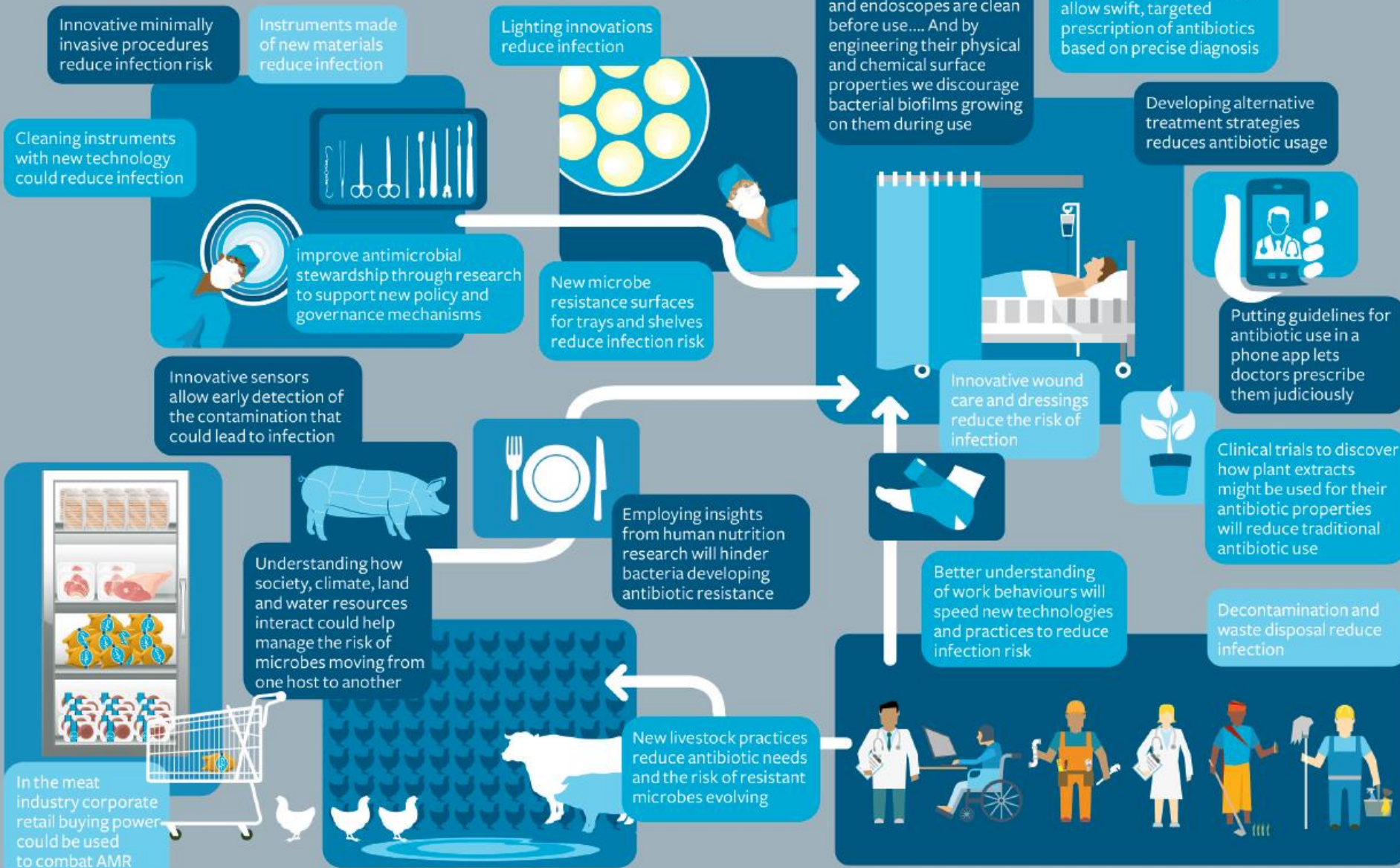
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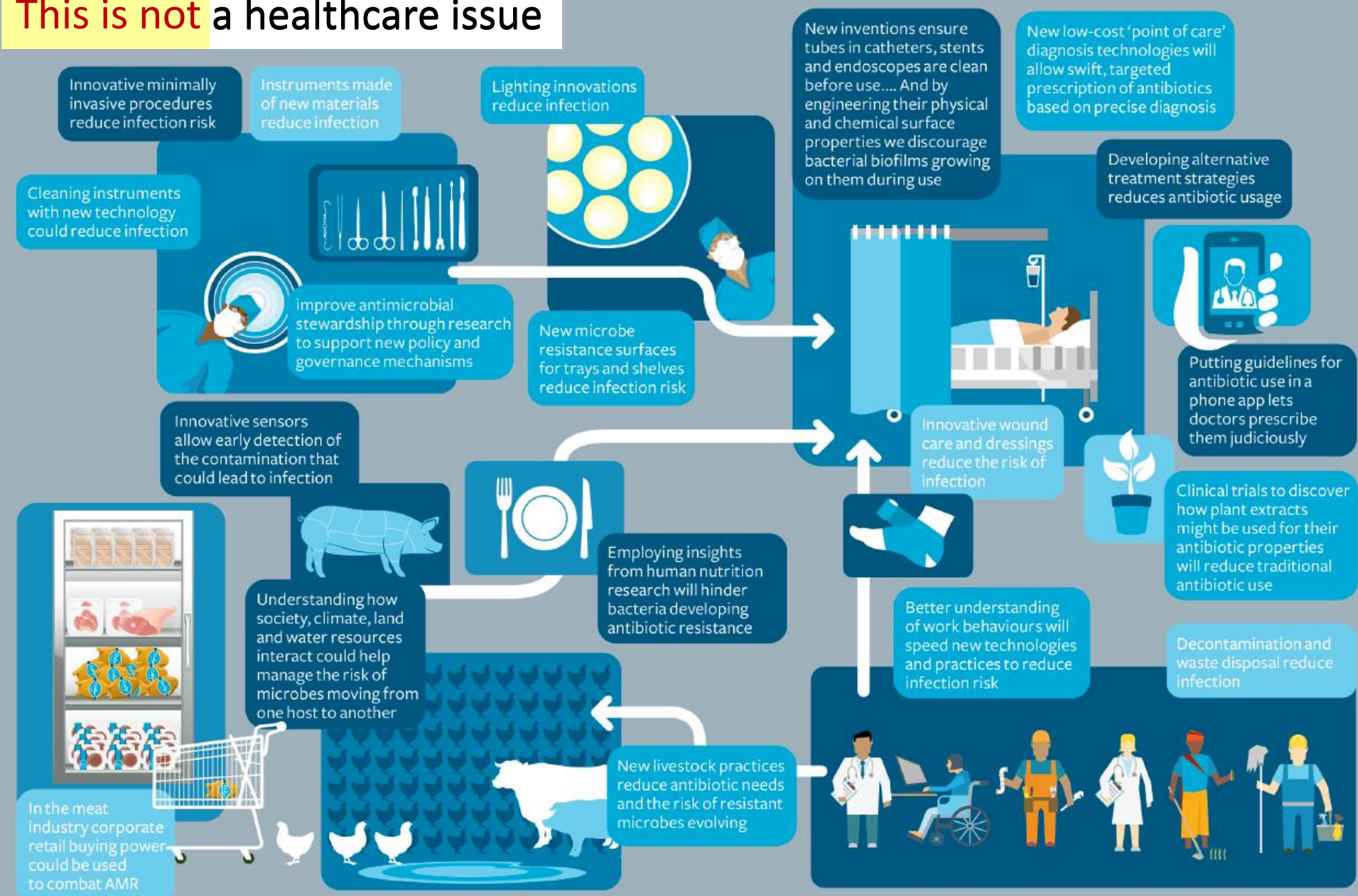
Clinical trials to discover how plant extracts might be used for their antibiotic properties will reduce traditional antibiotic use

Better understanding of work behaviours will speed new technologies and practices to reduce infection risk

Decontamination and waste disposal reduce infection



This is not a healthcare issue



There are 5 Research themes



Preventing Infection

Our interdisciplinary research spans medicine, engineering and biological science faculties



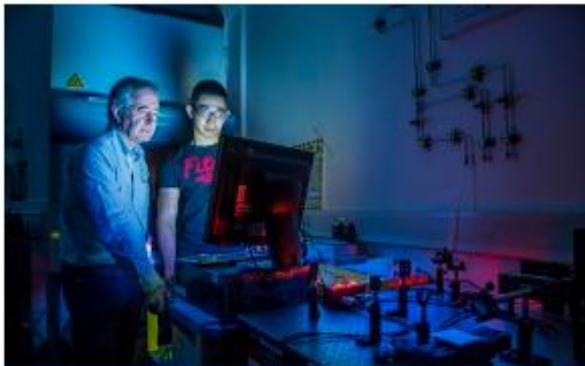
Behaviour in the wider world

Behaviour, landscape and environment influence the relationship between animal and human health



Pharmacology and Therapeutics

We need to consider how to achieve impact in the wider world



Sensing and diagnostics

Diagnosis and correct antibiotic treatment can help prevent serious antibiotic resistance



Clean water, sewage and waste

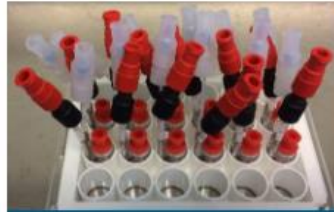
New technologies to produce clean water and treat waste, preventing the spread of infection

Pharmacology and Therapeutics



Characterising infectious diseases

Using cutting edge sequencing technology in developing countries



Novel approach to tackle tuberculosis

Combining research in cell culture and microfluidics



Preventing prosthetic infection

Localised use of antibiotics to improve infection management



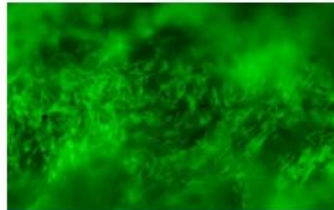
Antibiotics and nanoparticles

Understanding which nanoparticles bind to bacteria, in the delivery of antibiotics



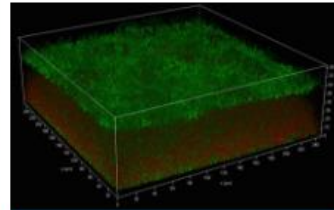
Pelargonium for cough

A clinical trial evaluating the feasibility of using pelargonium for acute cough



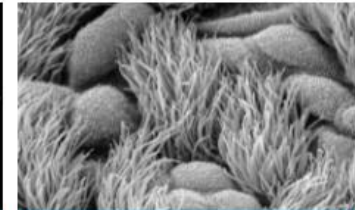
Innovative wound cleaning

exploring the use of a novel flushing system for cleaning wounds



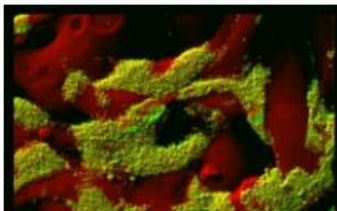
Tackling Otitis Media (Glue Ear)

Targeting bacterial metabolism to reduce antibiotic tolerance



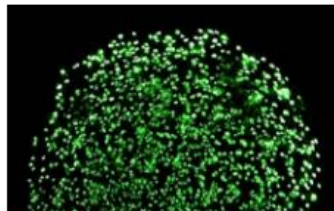
Protecting our airways from infection

Using simple sugars to clear bacteria and prevent infection



Tackling the 'superbug' Neisseria gonorrhoeae

Developing vaccines to combat resistance to antibiotics



Fighting tuberculosis

A new way of testing antibiotics to help in the fight against TB and other infectious diseases.

There are 5 Research themes (again)



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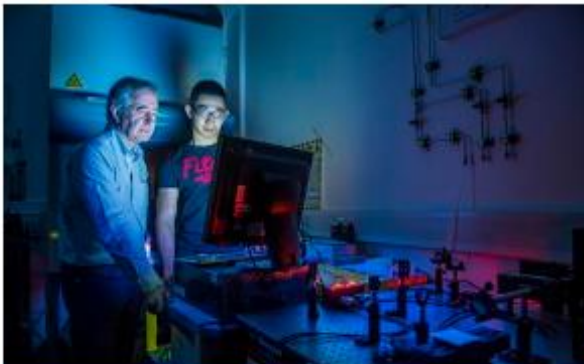
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Behaviour in the wider world



PRIMIT

a simple internet programme to encourage handwashing reduces the risk of infection



Farm environments

We must adjust the way we treat farm animals to reduce infection



Disease risk

Diseases can transmit from livestock to humans



AMR is an ethical problem

Such problems must be addressed as part of a successful policy response to emerging drug resistance



Designing interventions for easy uptake

A key part of NAMRIP's philosophy is designing solutions with the end user in mind.



Fighting superbugs on the home front

Understanding the domestic contribution to the rise of Antimicrobial Resistance in the environment

Award-winning Public Engagement Programme



Recognition for NAMRIP team

NAMRIP awarded the 'Wow Factor and Impact' prize at awards evening



NAMRIP takes AMR to BBC Countryfile Live show

Spreading the word about Anti-microbial Resistance



NAMRIP members attend Camp Bestival

Chatting to families about AMR and the research underway at Southampton University



NAMRIP members participate in Meet the Scientist

Talking to Secondary school students about our AMR research



NAMRIP at the Cheltenham Science Festival

Sharing our NAMRIP exhibits with an enthusiastic young audience



NAMRIP exhibits at Science and Engineering Day

Visitors of all ages interested in how we're tackling resistance to antibiotics



NAMRIP members take part in Pint of Science

Science talks delivered in a fun, engaging and approachable way



Beating infections without jargon

NAMRIP are training AMR scientists to communicate with the public and each other without the use of jargon

To solve societal problems, research must be translated on a societal scale..

GermDefence



Why try to lower the risk of being ill?

No-one likes having colds, flu or an upset stomach, but we get used to putting up with them.

By using the simple ideas on this website you can actually cut down on how many illnesses you and your family get each year, and how bad they are.

Protecting Your Health.

This is really important if anyone in your house is more at risk from illnesses - **for example young children, older people, or people with poor health or breathing difficulties such as asthma.**

It may take a bit of practice for you and your family to use the ideas on this website.

But once you have learnt them they will become habits that you'll do easily.

And they will help protect you from being ill every year.



[Back](#)

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[Click Next to find out the benefits of cutting down on germs](#)

[Next](#)

Randomised Controlled Trial Findings

- 20,066 participants over 3 winters;
- Participants (the people they lived with) had less illnesses;
- Participants had fewer GP consultations, & prescription;
- And if they were ill they recovered quicker.

Hand Cleaning



Hand Cleaning



Hand Cleaning

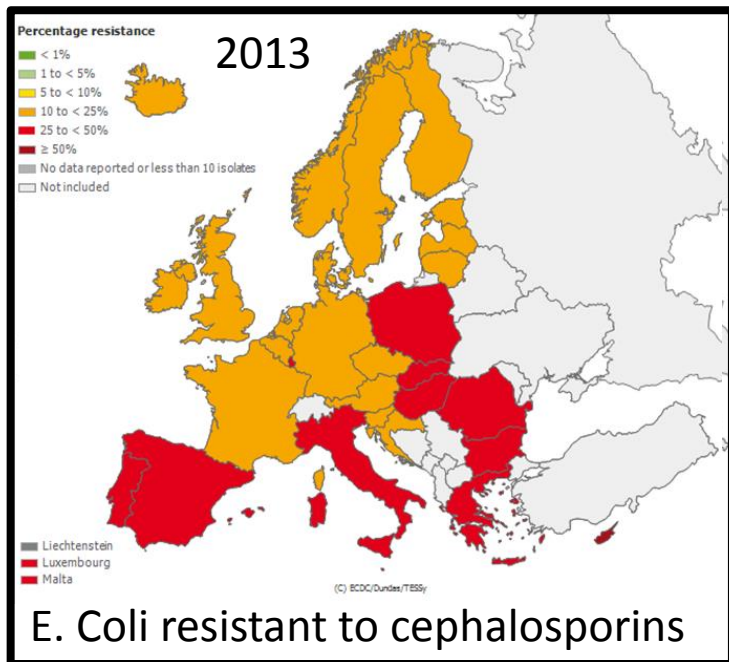
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We don't have 35 years.

Multidisciplinary research results in 3-5 years translated to 1 million people in 10 years.

A global problem: AMR does not respect borders.

An example from food retail:



Food retail affects AMR

AMR will affect food retail





Foreign &
Commonwealth
Office



NAMRIP



World Health
Organization

REGIONAL OFFICE FOR
Africa Congo

INDEPTH Network



Better Health Information for Better Health Policy



MAKERERE UNIVERSITY

Uganda



UFMG

Brazil



UNIVERSITY OF GHANA



African Population and
Health Research Center
Kenya



COLLEGE OF MEDICINE



CENTRE FOR
SOCIAL RESEARCH

Steering committee: Global NAMRIP

Steering Group

- Professor Tim Leighton (Chair);
- Professor Davison Munodawafa, **World Health Organisation**;
- Andrew Smith, **Foreign & Commonwealth Office**;
- Professor Antonio Luiz Pinho Ribeiro, **Federal University of Minas Gerais, Brazil**;
- Professor Osman Sankoh, **Executive Director of INDEPTH Network**;
- Professor Allen Wu, **Nanjing University, China**;
- Dr Nazarius Mbona Tumwesigye, **Makerere University, Uganda**;
- Professor Victor Mwapasa, **University of Malawi**;
- Mary-Jane Butler, **Widows and Orphans in Rural Kenya**;
- Dr Alister Munthali, **Centre for Social Research, Malawi**;
- Dr Catherine Kyobutungi, **African Population & Health Research Centre, Kenya**;
- Dr Don Mathanga, **Malaria Alert Centre, Malawi**;
- Dr Mawuli Dzodzomenyo, **University of Ghana**;
- Professor Suman Chakraborty, **Indian Institute of Technology Kharagpur, India**;
- Professor Chew Chieng Yeo, **University Sultan Zainal Abidin, Malaysia**.

Projects to date:

- 'StarHealer: Project Navrongo' (with Navrongo Health Research Centre, Ghana)
- 'Development and evaluation of new technology to treat minor trauma in community-based healthcare' (with CHAG, Ghana)
- 'Application of rapid antimicrobial resistance surveillance and serotyping of Streptococcus pneumoniae in developing countries using novel genome sequencing technology' (with UniSZA, Malaysia)
- 'Microbial pathogen detection in ocular infection using microfluidic impedance flow cytometry' (with Lighthouse, Kenya and Christian Medical College, Vellore, India)
- 'Integrating the 3-dimensional bioelectrospray cell culture model with a microfluidic platform to model real-time physiological changes' (with African Health Research Institute, South Africa and Indian Institute of Technology Kharagpur, India)
- 'Addressing Drivers of Resistant Sepsis in Africa' (with Kenya Medical Research Institute (KEMRI), Ethiopia)
- 'Tackling AMR at the interface of food production and public health in Low and Middle Income Countries' (with University of Cape Town; and Centre for Social Research, University of Malawi)
- 'Partnership in demographics and geographic surveillance for AMR between NAMRIP and Navrongo Health Research Centre in Ghana'
- 'Water disinfection in Low/Middle Income Countries by bubble activity' (with Turin)
- 'Commonwealth Scholarship Commission Professional Fellowship link to the InDepth network, 2017' (Ghana)

The end