

Microbe of the month

Breaking The Chain of Infection

Cutimed®

FEBRUARY 2022 NEWSLETTER

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Featured this month:

ZOONOTIC DISEASE

The animal connection

Hello readers!

Microbe of the Month is now in its 5th year! Our aim is to create awareness about existing and emerging pathogens of clinical importance in healthcare today, in an easy-to-read, understandable format. Each newsletter explores the origin and epidemiology of specific microorganisms, the infections they may cause and modes of transmission, and highlights the measures which should be taken to limit their spread.

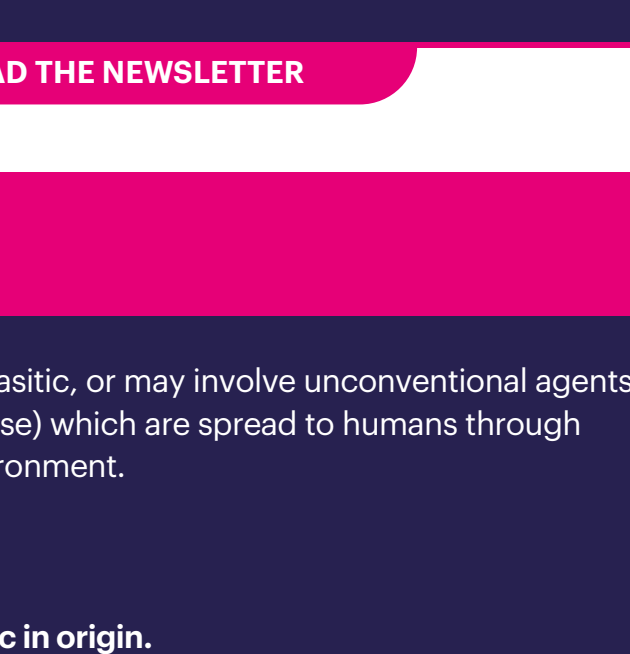
Please use this newsletter as a teaching tool in your workplace, share it widely with colleagues and start an infectious dialogue about topical issues in infection control!

Zoonotic disease is a highly relevant subject on which to begin the New Year.

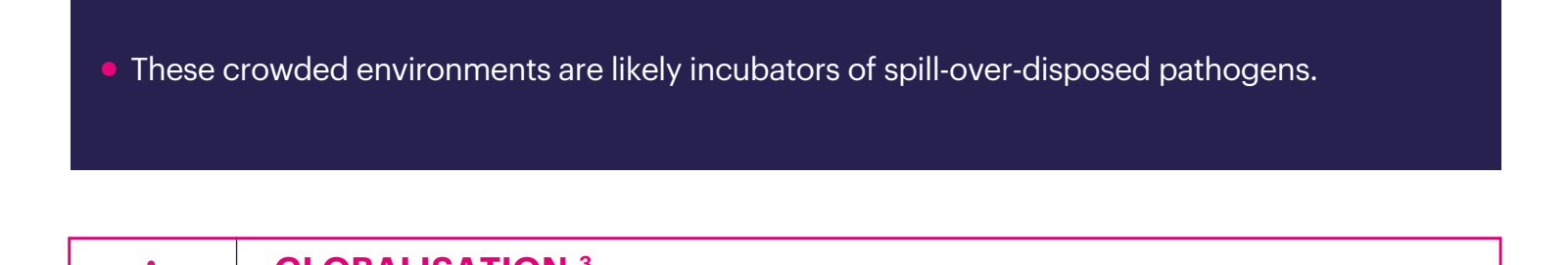
The COVID-19 pandemic has challenged many firmly held beliefs and completely changed the landscape of infection prevention and control - how do these two seemingly distant issues intersect?

The term "Zoonosis" is derived from the Greek word "Zoon", which means animal, and "nosos", which means illness.

A zoonosis is an infectious disease that has jumped from an animal to humans. Among the human pathogens, about 61% are zoonotic.^{1,2}



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KEY FACTS:^{1,2}

- Zoonotic pathogens may be bacterial, viral or parasitic, or may involve unconventional agents (e.g., prions, which cause Creutzfeldt-Jakob disease) which are spread to humans through direct contact, or through food, water or the environment.
- There are over 200 known types of zoonoses.
- More than 60% of human pathogens are zoonotic in origin.

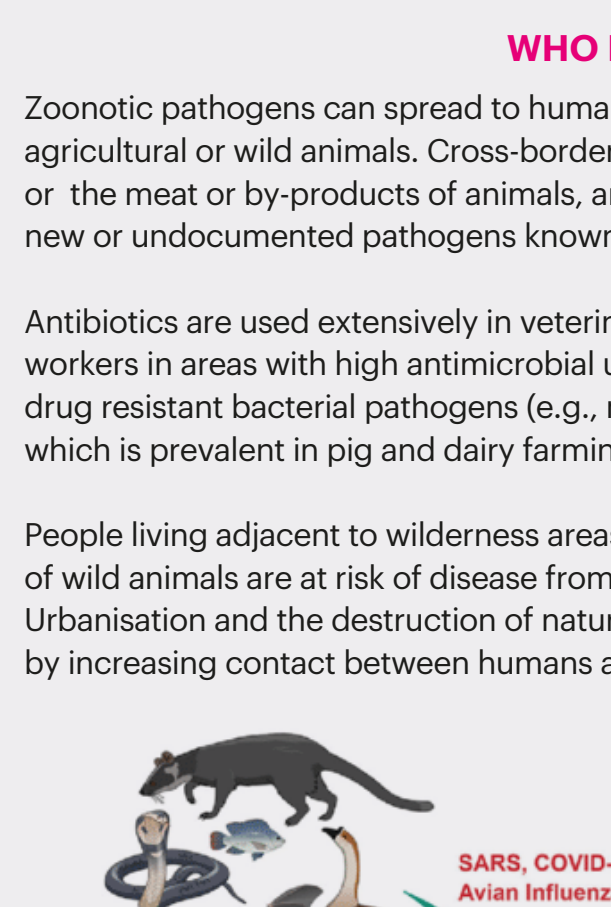
- Factors such as climate change, urbanisation, animal migration, trade, travel, tourism, intensive animal farming, poverty, and the exploitation of natural environmental resources are just a few examples which have influenced the emergence, re-emergence and distribution of zoonotic diseases.
- These crowded environments are likely incubators of spill-over-disposed pathogens.



GLOBALISATION:³

The growing interdependence of the world's economies, cultures and populations, brought about by cross-border trade in goods, services and technology, and flows of investment, people and information.

Mankind has been plagued by epidemics caused primarily by infectious diseases that originated from animals, especially wildlife. The establishment of sustained transmission involves the interplay of complex mechanisms; and whilst humans have coexisted with domestic and wild animals for millennia, several factors have intensified the 'animal-human interface' in recent decades, increasing our interactions with animals, and consequently, the risk of disease 'spill-over'.⁴



A vendor arranging bat meat in a market in Indonesia.

In an increasingly globalised planet, a 'spill-over event' that causes efficient and sustainable transmission between humans can spread very quickly.

This has been well-demonstrated by the ongoing coronavirus disease (COVID-19) pandemic that has resulted in an unprecedented global public health, social and economic crisis.

The current pandemic has also illustrated that, despite our experience with emerging zoonotic diseases (EZDs) and outbreaks such as Zika, Severe Acute Respiratory Syndrome (SARS), Ebola, and highly pathogenic H5N1 avian influenza (and subsequently improved national and global surveillance systems), humanity is unable to prevent new zoonotic diseases originating from animals.⁴

WHO IS AT RISK?^{4,5}

Zoonotic pathogens can spread to humans through any contact point with domestic, agricultural or wild animals. Cross-border smuggling, and markets which sell live animals, or the meat or by-products of animals, are particularly high risk due to the large number of new or undocumented pathogens known to exist in wild and domestic animal populations.

Antibiotics are used extensively in veterinary medicine and agriculture - for example, workers in areas with high antimicrobial usage may be at increased risk of also acquiring drug resistant bacterial pathogens (e.g., methicillin resistant *Staphylococcus aureus* MRSA which is prevalent in pig and dairy farming settings).

People living adjacent to wilderness areas or in semi-urban areas with higher numbers of wild animals are at risk of disease from animals such as rats, foxes and raccoons. Urbanisation and the destruction of natural habitats increase the risk of zoonotic diseases by increasing contact between humans and wild animals.

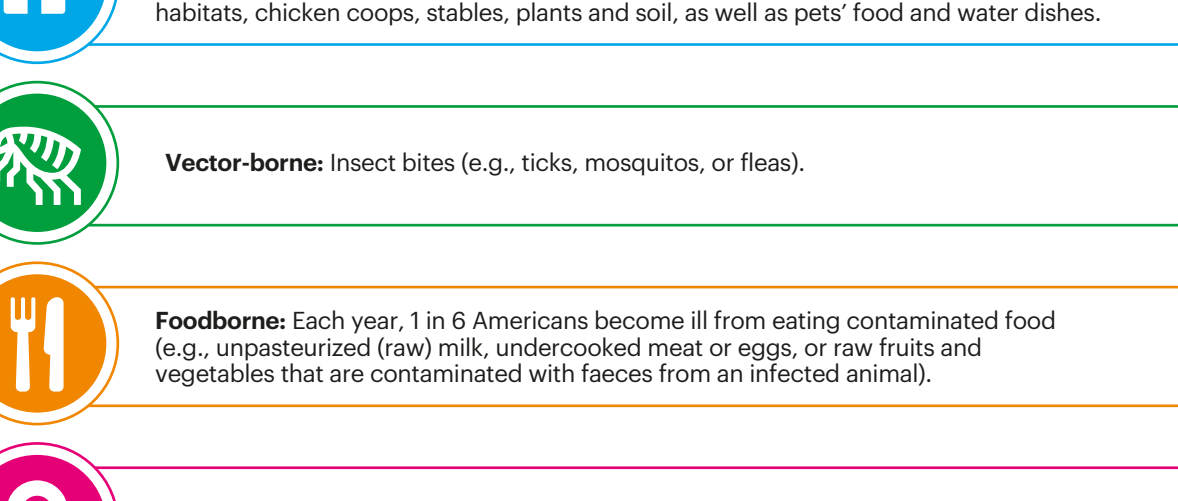
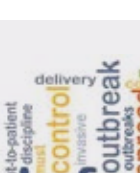


Figure 1. Examples of zoonotic diseases that have direct (re-) emerged at the animal-human interface. Transmission pathways include direct contact through handling of living animals (wildlife trade, domestic animals), and the preparation of slaughtered animals for consumption of meat or for traditional medicine uses.⁴

How do Pathogens Spread between Animals and People?⁶



Direct contact: Coming into contact with the saliva, blood, urine, mucous, faeces or other body fluids of an infected animal. Examples include petting or touching animals, and bites or scratches.



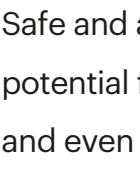
Indirect contact: Coming into contact with areas where animals live, or objects or surfaces that have been contaminated. Examples include aquarium tank water, pig habitats, chicken coops, stables, plants and soil, as well as pets' food and water dishes.



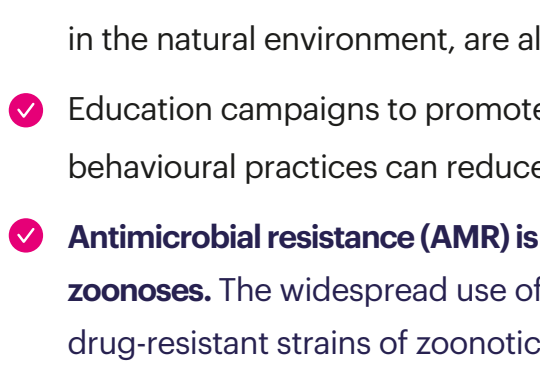
Vector-borne: Insect bites (e.g., ticks, mosquitoes, or fleas).



Foodborne: Each year, 1 in 6 Americans become ill from eating contaminated food (e.g., unpasteurized (raw) milk, undercooked meat or eggs, or raw fruits and vegetables that are contaminated with faeces from an infected animal).

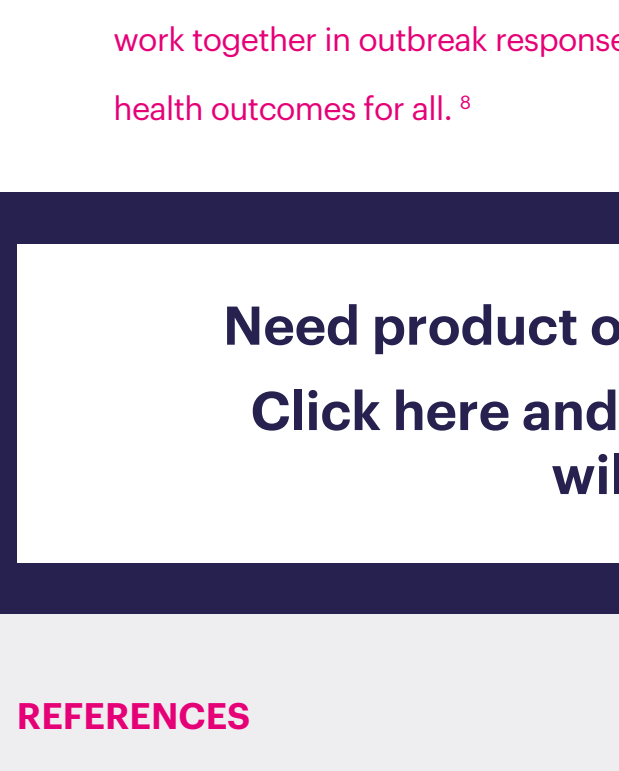


Waterborne: Drinking or coming into contact with water that has been contaminated with faeces from an infected animal.



EXAMPLES:

- Zoonotic influenza (e.g., multiple strains of swine and avian influenza)
- HIV
- Ebola
- Salmonellosis
- Emerging coronaviruses (e.g., severe acute respiratory syndrome SARS, Middle East respiratory syndrome MERS)
- Rabies
- Zika, West Nile virus and malaria
- Bubonic plague
- Anthrax
- Brucellosis
- Lyme disease



THE BOTTOM LINE...

- 6 out of every 10 human infectious diseases are zoonotic in origin.
- Globalisation, increasing human populations, intensive farming methods and cultural practices drive the continuing emergence of zoonotic diseases.
- Safe and appropriate guidelines for animal care in the agricultural sector help to reduce the potential for foodborne zoonotic disease outbreaks through foods such as meat, eggs, dairy and even some vegetables.
- Standards for clean drinking water and waste removal, as well as protection of surface water in the natural environment, are also important and effective.
- Education campaigns to promote handwashing after contact with animals and other behavioural practices can reduce community spread of zoonotic diseases when they occur.
- Antimicrobial resistance (AMR) is a complicating factor in the control and prevention of zoonoses.** The widespread use of antibiotics in livestock farming increases the risk of drug-resistant strains of zoonotic pathogens spreading quickly in animal and human populations.
- In the United States an antibiotic-resistant infection is acquired every 11 seconds, and every 15 minutes someone dies as a consequence.⁷
- The 'One Health' approach recognises the connection between people, animals, plants, and their shared environment, and calls for experts in human, animal and environmental health to work together in outbreak responses - and in the long term, to achieve the best possible health outcomes for all.⁸**

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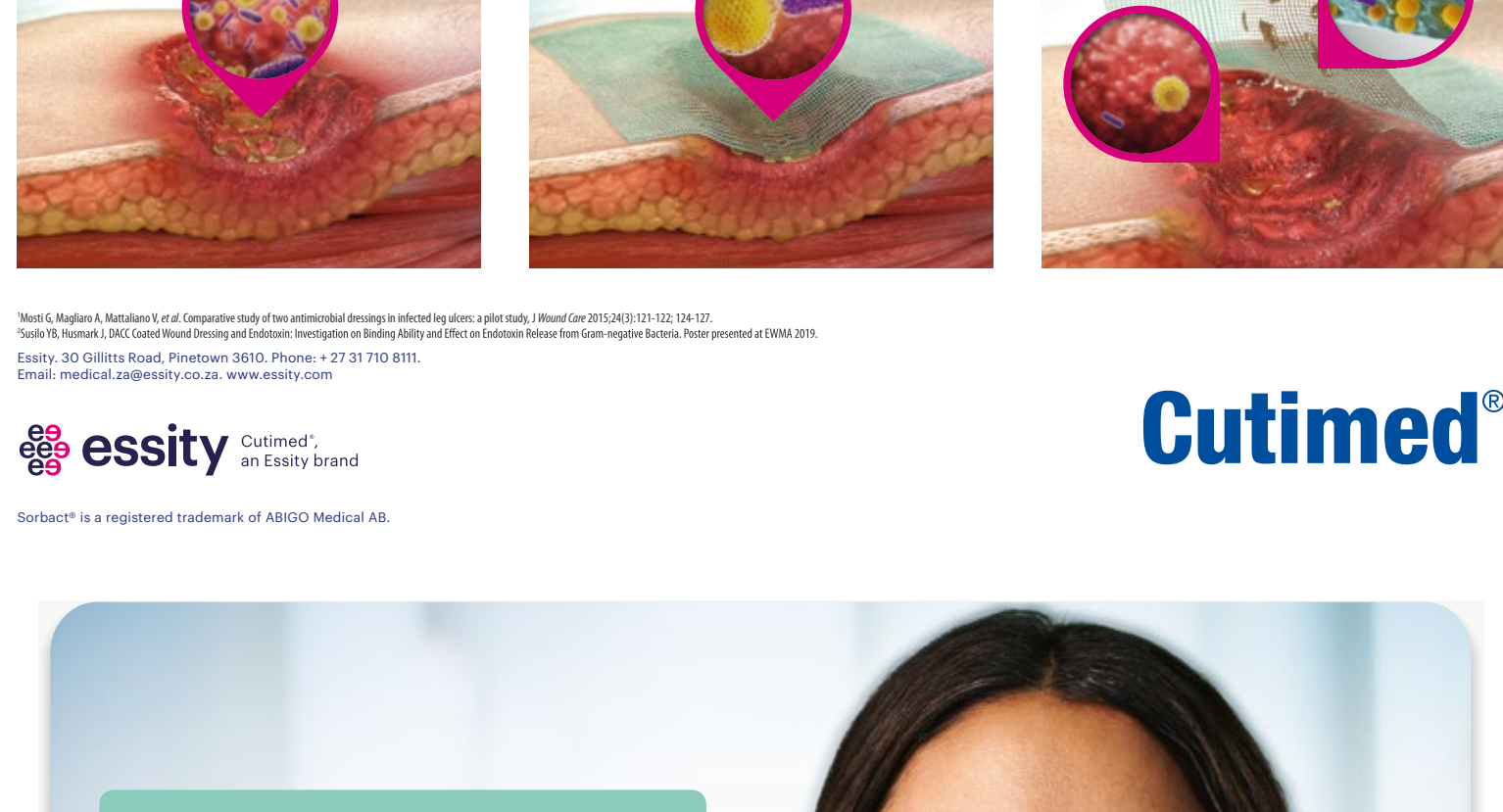
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Leukomed® Sorbact® and Cutimed® Sorbact® utilise the effective Sorbact® Technology that binds bacteria with a purely physical mode of action. Sorbact® Technology removes bacteria without releasing possibly harmful endotoxins.²



¹ Staronwicz J, Bizon N, Cendrowski K et al (2018) Randomized controlled trial evaluating dalkylcarbonyl chloride impregnated dressings for the prevention of surgical site infections in adult women undergoing caesarean section. *Surg Infect* 19(1): 427-35

² Davies H, McManter J et al (2015) Cost-effectiveness of DACC dressing to prevent SSI following caesarean section. Presented at Wounds UK, Harrogate, November 2015

³ Cutting K, Maguire J (2015) Staff bioburden management. A critical review of DACC technology. *Journal of Wound Care* Vol 24, No 5

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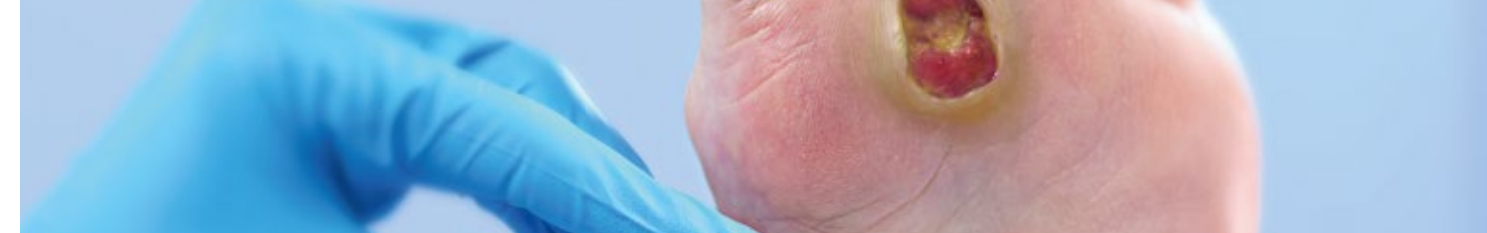
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