



Introduction

Welcome to the first edition of the ARM quarterly newsletter! We hope to make this publication valuable to you with several brief articles that provide unique insights, some ideas about how to address specific problems and introduce potential risks that may not yet be on your radar.

The primary authors will be Dave Ingram and Max Rudolph, along with a number of additional ARM consultants. We have been active participants in the risk management, actuarial, investment and insurance spaces for many years. We plan to share our experience and knowledge to assist executives from insurers of all sizes and specialties to make better decisions. We expect to present multiple perspectives on issues, but we will always tell you our opinion of the most compelling approach.

Those who become subscribers can suggest topics for articles and ask questions of the authors during our follow-up webinars and discussion sessions. We expect to conduct some surveys, as you see in this issue, as well as walk the reader through methods to think about issues and build out their capabilities to resolve those issues in the future. Ever cognizant of regulatory requirements, leveraging them in ways that add value to your company in practical ways will be our focus.

Published by Actuarial Risk Management (ARM), the Strategic and Risk Solutions for Executives (SRSE) subscription will consist of two paid tiers. The newsletter is free to all who are interested.

A webcast is available at either the company or individual level, and an offering that extends the general webcast to include a follow-up one-on-one discussion with the newsletter authors is also available.

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on our journey!**

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Bacterial Antimicrobial Resistance

The hope is that our newsletter will engage you in new ways with risk and think over longer time horizons about a future that may be new to you. We are not experts in everything but bringing up a topic will add to the tool kit insurers are considering. Bacterial antimicrobial resistance (AMR) is such a topic, one that is growing in plain sight but does not receive much attention. The medical community has had tools to deal with microorganisms like bacteria and viruses such as antibiotics, antifungals and antivirals for many years. If you get an infection, it normally is not a big deal. Unfortunately, this has lulled us into a false sense of security.

Bacteria and viruses are often confused. A virus can't survive without a host, is smaller and consists of a protein coat around either DNA or RNA genetic material. COVID-19 is a virus. Coronavirus is typical in that its RNA randomly mutates, periodically making changes that create a new dominant variant. A virus survives longest when it mildly impacts its host but doesn't kill it, allowing it to spread to other creatures.

Bacteria, on the other hand, are larger than viruses and are independent living organisms that use DNA to reproduce. They are very hardy and often specific to an environment like hydrothermal vents deep in the ocean or in your intestine (gut). Bacteria can help or harm, depending on the circumstances. Mutations occur during replication or exposure to a mutagen (e.g., chemicals, radiation).

Mutations occur randomly, with successful ones building resistance to drugs that previously defeated them. Harmful microorganisms are called pathogens, and antibiotics were developed following the discovery of penicillin by Alexander Fleming in 1928. These wonder drugs were very successful, but bacteria are catching up by

evolving to evade existing drugs.

Developing new antibiotics is very challenging, time consuming and expensive, often without success. In this game of adjustments, we are standing still and the bacteria continue to evolve. While medicine has had great success, bacteria are battling back and we are starting to lose. It is time to resist this trend with a plan.

The implications to our daily lives are material. In the not so distant past a cut or scrape that became infected could be fatal. Rates of survival to adulthood are important metrics even now in some locations without ready access to antibiotics - increasing antimicrobial resistance make these trends globally important.

Much of the strongest resistance is currently found in hospitals. This leads to a growing dilemma. Who wants to have a voluntary procedure that could be deadly? Everything from knee replacements to Botox injections becomes risky. And what mother would allow their child to play football or rugby with such a risk on every field or pitch, knowing that a simple abrasion could be deadly?



Bacterial Antimicrobial Resistance



Insurers care about AMR for several reasons. It impacts health insurers as claims increase. It impacts life insurers as mortality increases at all ages and longevity decreases. It impacts all institutional investors as a population with shortened lifespan looks at investments in housing and other purchases in new ways.

Bacterial antimicrobial resistance is a topic that insurers should monitor and encourage research into building new tools to fight these pathogens.

As this newsletter was being written, the Lancet published a thought-provoking paper on bacterial AMR (The Lancet Feb 12, 2022). The paper notes the regional differences in this global problem. In an area like sub-Saharan Africa their suggestion is to expand availability of antibiotics, while in south Asia (think a little broader than India to Malaysia) they recommend restricting antibiotics as they are overused. While forms of pneumonia and staph infections were the leading problem bacteria, a recent pathogen commonly found on the battlegrounds of Iraq and Afghanistan, *A baumannii*, is causing problems. Permafrost is a likely future topic for this newsletter, but one concern is that ancient bacteria unknown today could melt out of the frozen tundra and be released back into the environment.



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