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We are all overconfident. Who among us hasn't predicted risk events that never occurred? A little humility, along with encouraging alternative opinions and robust stress tests, can lead to value added by the risk team. By Dave Ingram.

Is there a role for zero cash flow assets? Page 6

Should insurance liabilities be backed by assets that don't pay recurring cash flows, like equities or venture capital? As might be expected, it depends. A product with optionality and regular withdrawals is not a good candidate, but short-term policies with low combined ratios can accept the extra yield if it doesn't become a concentrated position. By Max Rudolph.



Scenario Planning in 10 Steps Page 9

Like any successful process, scenario planning must be repeated consistently to be successful. From defining the purpose to effective communication and implementation, the steps suggest the importance of communication and planning. By Dave Ingram.

Vector Borne Illnesses Page 12

Mosquitos and ticks are spreading to higher latitudes and elevations due to climate change and warmer temperatures. Learn about the impacts and methods of control. By Max Rudolph.

Sign up for our June 12 webcast where we will discuss these articles



To Our Subscribers

We want to thank our new subscribers and welcome everyone to the tenth issue of the ARM Crossing Thin Ice newsletter! We hope that you find this publication valuable. With a few short articles meant to provide unique and valuable insights, we present ideas about how to address specific issues related to ERM and introduce potential risks and opportunities that may not yet be on your radar.

The primary authors are Dave Ingram and Max Rudolph. We have been active participants in the risk management, actuarial, investment and insurance spaces for many years.

Subscribers are encouraged to suggest topics for articles and ask questions of the authors during our follow-up webinars and podcasts. Ever cognizant of regulatory requirements and leveraging them to add value in practical ways is our focus.

Sponsored by **Actuarial Risk Management (ARM)**, Crossing Thin Ice is free to all readers and in all forms.

A free webcast and podcast with the same name are also available. If you would like to further engage the authors as consultants, for continuing education purposes or to join our Risk Management Discussion Group, please reach out. More info can be found throughout this newsletter. We hope to help you find a solution that meets your needs!

Please forward to others who study risk.
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The content of this newsletter is meant to be educational and thought provoking.

Nothing in it should be interpreted as investment advice.

Vector Borne Illnesses

The Vector Borne Illnesses (VBI) range is expanding northward as temperatures warm and winters trend shorter and less harsh. In the US, the range is expanding in Florida and other southern states as temperatures warm. Reproduction is boosted as temperatures rise. Ticks and mosquitos both prefer their surroundings moist. In New England, reforestation of areas previously cleared for farming provides additional habitat for deer and mice, followed by ticks and mosquitos (ecosystem disservices). Mosquitos can be controlled by reducing areas for stagnant water to accumulate. Chemicals can be sprayed, and genetic modifications introduced to limit reproduction, but mosquitos have proven that they are adaptable.

Current Status

There has been some success in reducing the number of deaths from malaria in Africa, especially in rural settings, but the mosquitos have evolved with people and are moving and adapting to life in cities. New mitigation strategies will need to be developed. South America currently is suffering through another dengue outbreak. The United States continues to see expansion of Lyme disease, and mosquito vector diseases are spreading north as warmer winters fail to limit their range. Zika virus, which is significant to pregnant women and can cause birth defects including small heads, has resurfaced in Brazil and should be monitored closely for cases elsewhere.



Preferred protection includes insect repellent, covering skin with clothing when outside, and use of protective netting while you sleep. Checks for ticks should occur on humans and pets immediately after outdoor activities.

Arthropods are invertebrates with jointed legs and a hard exoskeleton. VBI are spread by hosts that include ticks, flies, fleas, lice and mosquitos. Some carry pathogens (e.g., virus or bacteria) from a reservoir host, often a deer or mouse, or to those they bite opportunistically like humans.

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your favorite streaming service**

Vector Borne Illnesses (cont'd)

Ticks

Lyme disease is caused by a bacterium often carried by a deer (black legged) tick. It is found in the eastern half of the US. Symptoms include fever, rash and joint pain, and can last for months even after treatment. A dog vaccine is currently available but a human vaccine was pulled from the market 20 years ago due to lack of demand.

Lone star ticks, based primarily on the Pacific coast, can cause severe allergic reactions to red meat. Other pathogens carried by ticks can cause flu-like symptoms, blood clots and organ failure.

Ticks also infect pets, wildlife and livestock. They have been known to swarm cattle and literally suck all the blood out of them.

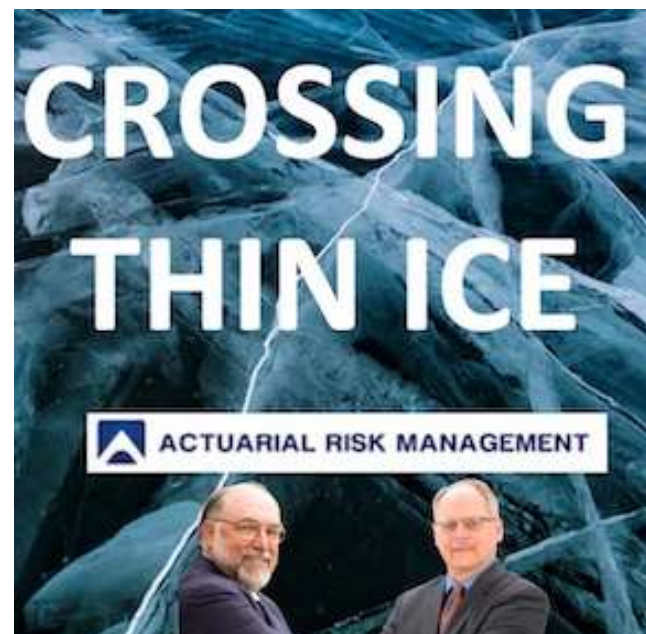
Especially relative to diseases borne by mosquitos, relatively few resources have been allocated to managing or eradicating tick-based diseases so far, even though cases are growing exponentially.

Mosquitos

There are quite a few pathogens (e.g., virus, parasites) transmitted by mosquitos. In North and South America diseases include chikungunya, West Nile, yellow fever, Zika, dengue and encephalitis. Globally malaria is the top concern, especially for children in sub-Saharan Africa. Symptoms range from flu-like to neurological, with many asymptomatic but some deaths. Most mosquitos do not carry these diseases. Some vaccines are available, with funding provided by governments and NGOs.

Visitors should always utilize existing vaccines, so they don't bring new diseases back home with them to be spread in a new range.

Additional funding for VBI research could be used for vaccine development, genetic research, and general studies that look for and implement solutions.



Ask Dave and Max about their
quarterly
Risk Management Discussion
Group



Actuarial Risk Management

Global Actuarial Consultancy

Crossing Thin Ice

Now providing three ways for you to get insights, strategies and solutions from ARM consultants to help resolve your risk issues.

Newsletter

- 3 to 5 articles quarterly
- Written by Dave Ingram, Max Rudolph and other ARM consultants focusing on risks faced by insurers and risk management strategies
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- One-hour live webcast once each quarter following the newsletter publication
- Webcast includes brief presentations, interviews with authors and live Q&A with your questions answered regarding the newsletter topics

Podcasts

- Two per month
- Delivered by Dave Ingram & Max Rudolph
- Presenting material from the newsletters, webcasts and current topics in a totally audio format.
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Insurers have faced challenges from inflation, high interest rates, high turnover and shrinking candidate pool, and the next few years will see a radically changing environment for insurers. We will be using the Crossing Thin Ice platform to identify emerging risks and delve into what we see as the drivers of future success.

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DAVE INGRAM | SENIOR ERM CONSULTING ACTUARY

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