The think tank view: disaster risk scorecards for cities

Interviewer: Gareth Byatt – Principal Consultant, Risk Insight Consulting
Interviewees: Peter Williams – Strategy Consultant and Chair of ARISE-US
                           Ben Ryan – Professor, Frist College of Medicine, Belmont University

September 2023

The disaster resilience scorecard for cities UNDRR webpage. Image from: UNDRR

Peter and Ben,

Thank you for making the time to talk with me about the UNDRR cities disaster scorecard action guide. I can see linkages between the cities scorecard and the accompanying action guide and an initiative I am working on with Ilan Kelman (of UCL) and Ana Prados (of UMBC), which is called Disasters Avoided. Our premise is that, whilst we can't prevent all the events that occur around the world such as wildfires, floods and storms, and earthquakes, disasters can be avoided when the right action is intelligently taken upfront, in preparation for events, and immediately afterwards.

I can also see linkages with the scorecard and action guide and my work in urban resilience, so I'm looking forward to understanding more about them both.
Perhaps we can start with a brief overview of your backgrounds and the work you are currently focusing on?

Peter: Thanks for the invitation. The majority of my career has been in the private sector. Nowadays I am the Chair of [ARISE-US](), which I'll explain in a moment, and I consult independently to businesses, to help them with their ESG needs, including Scope 3 emissions and climate risks to their operating locations. I also consult on aspects of smart cities. I have lived in California since 1999, I may add.

Prior to my current activities I spent 30 years with IBM and precursor companies, where I was involved in water management, sustainable supply chains and smart cities. One of my roles at IBM was Chief Technology Officer for [Big Green Innovations](), which was their environmental business start-up unit at the time. In due course, the Big Green Innovations business integrated into what IBM was doing to support a smarter planet. Disaster resilience became an area of focus for smart cities at IBM, and it became an area of focus for me (at the most simplistic level, if a city is not resilient it cannot be said to be smart).

My role in this part of IBM led to me becoming their representative to what was at the time a formative organisation called [ARISE](), set up to be a business engagement platform for disaster risk reduction, and initiated by what was then called UNISDR (now known as [UNDRR]() – the United Nations Office for Disaster Risk Reduction). ARISE has grown to be a global network today.

The first initiative I oversaw for ARISE was as lead author for a [disaster resilience scorecard for cities](), which is based on [the Ten Essentials]() of [the Sendai Framework](). This scorecard is still in use and has been reissued a few times since its first release. To date I believe it has been used by over 400 cities around the world and translated into a 16 languages. Over time, specific subsets of the scorecard have been created as people have identified additional needs (which has been great to see). These related instruments include [a buildings scorecard]() which applies to industrial and commercial real estate and campuses, and [an addendum for public health](), which is the vehicle through which I started collaborating with Ben, who was a peer reviewer of it (after a team had concluded that public health was not sufficiently incorporated into the ten essentials of Sendai and needed more focus).

The scorecard has also led to further addendums for [food](), [cultural heritage](), and a specific focus annex for [inclusion of persons with disability](). Just recently we have created a new profile called a [wildfire resilience scorecard](), to help cities deal with wildfires, which is part of our community wildfire toolkit.

In 2020, following retiring from IBM I became the Chair of [ARISE-US]() (ARISE has something like 35 national networks around the world – you can see more details on [the ARISE global website]()). The Americas ARISE region (for which the networks of the US, Canada, Mexico, Caribbean and several from Latin America are coordinated out of Panama) and the Asia ARISE region both have a broad coverage (in Asia, a new ARISE network has been created in Indonesia, as a recent example of growth).

In Europe there are some ARISE beacon cities, including _Greater Manchester_ in the UK and _Amadora_ in Portugal. ARISE is looking at how it can support activities in Africa and is expanding fast. Any country that is not currently part of ARISE and is interested in setting up a chapter is very welcome to talk with us about the idea.

Ben: _I spent the first part of my career in my native Australia, working in local, state and federal governments in public health roles. I started to engage with UNISDR (now UNDRR) whilst undertaking a PhD. I have been living in the US since 2017, based initially in Hawaii working for the Asia Pacific Centre for Security Studies and I then moved to Baylor University in Texas, where I helped to roll out the public health scorecard as part of a project funded by **WHO Centre for Health Development**. We used version 2.0 or the scorecard, which was launched in April 2020 and superseded the first version from July 2018. As part of this project the scorecard was applied in 13 different locations in eight countries. We collated all recommendations from feedback on it using a **Delphi process at the UNDRR office in Incheon**, South Korea, and we reached consensus on strategies for building public health systems across multiple countries._

It is great to have developed the public health scorecard for participating cities using a consensus-based approach, and we want to ensure the outputs from the scorecard are translated into practice. We also want to explore how the scorecard method can be used post a disaster to guide the reconstruction of health systems and other infrastructure.

I am now a professor at Belmont University in Nashville, which is one of the key healthcare centres for the US. The university engages globally on health initiatives and liaises with various partners in its work. For example, a UNDRR workshop in October 2023 hosted at the university explores the role of technology in disaster risk reduction. Attendees include people from NASA, FEMA, ARISE, UNDRR, the World Food Programme, Oracle and various US universities and NGOs, including the largest NGO in the Nashville area. This workshop is focused on identifying how technology can help disaster risk reduction efforts across the Americas and Caribbean.

Peter: _The point Ben mentioned just now about putting scorecards into practice is key – scorecards are great for telling us "Where we are" at a point in time; they then need to be translated into how to move forwards with tangible actions. We have been liaising with MCR2030 recently about the "translating into action" focus, and through these conversations we were asked to write an action guide to help people get the most out of the scorecard._

The action guide that we have developed to accompany the scorecard as a "second step" has four chapters to it. The first is a prioritisation methodology; the second is about community engagement (in final draft as of September 2023); the third focuses on the financial architecture of disaster risk; the fourth is a compendium of standards relevant to disaster risk reduction and sustainability (for this fourth point we have been working with Arizona State University and ASTM). I should add as well that everything that ARISE produces is available to everyone free of charge, for whatever use people want to make of it (including using it towards for-profit activities). We want to ensure tools are put into the hands of those who need them.

If people need particular support and assistance to implement these tools, they can choose how to do that.

Gareth: Your point about translating scorecards into tangible and focused actions reminds me of a similar conversation I have had with an expert on climate change and adaptation in April 2023, who described how there is some good work being undertaken to create climate risk assessments, but it is proving harder for people to agree quantifiable targets as actions to take for climate adaptation, and that it is important to work out how to link them all together.

I recall from an [MCR2030 webinar](link) in which you presented the action guide (on Sept 6, 2023) that is about helping people make the most of the scorecard, by identifying good follow-up actions. I remember you advised that cities should first complete the scorecard (preferably [the detailed version](link)) and ensure the city has a DRR vision and a good governance structure in place, and then focus on the "phase 2" process of using the action guide. I presume that, given the focus of ARISE, the private sector plays a key part in assessing and agreeing actions to take from a scorecard review, using a systems approach as you describe in the guide.

Peter – Absolutely, business involvement in the scorecard assessment and agreement on actions is critical. I would say that it is important for city and town authorities to engage properly with Small and Medium-sized Enterprises (SMEs), not just large corporations (which are of course also important). SMEs are arguably the economic heartbeat of a city or a town. An urban environment can take years to recover when a disaster occurs. The more that SMEs can be set up with good disaster resilience and to understand the key aspects of preparation and post-event recovery, the more chance that the government can sustain the economic sustainability of the city or town. as well as the physical survival of people and infrastructure.

Gareth: You mentioned the global coverage of ARISE earlier. I talked with a team member of ARISE Japan in September 2023, and one of the points we discussed was how things work in disaster resilience between local / city authorities and businesses in Japan, which in a nutshell is done in a very integrated and planned manner.

Peter: Japan are, in my view, world leaders in the way local authorities work and integrate with the private sector. They have a model that others can learn a lot from.

In many cities and towns (not in Japan, elsewhere) there is generally a lack of planning on the part of businesses (of all sizes) to think about how they can and should work closely with local city government to help shore up disaster resilience. A business can make its own operations and sites (be it a manufacturing plant, offices, retail or something else) as resilient as is practically possible.

However, if the day after a major event occurs they can't get their workforce to the site for days on end because their people are naturally occupied in dealing with their own homes and / or they can't travel to the workplace because infrastructure is down or blocked, then the business continuity plan of that business is disrupted regardless of how well they planned their own location's resilience and continuity.

Businesses should work with the city government and all parties should agree how to plan and be ready to implement preparedness actions to protect against an event, and response actions when something happens. The same is true for city governments, I should add. Of course, government teams need to focus on the safety of their citizens and ensuring public shared areas are repaired and / or cleared – and they also need to ensure they help their local economy get up and running as soon as possible, which is where the crucial liaison with businesses comes in. It is a two-way dialogue that does not happen as much as it should – and it is an area that ARISE is trying to encourage more of. Anything that can be done to broaden this dialogue is good.

For sure, I should add that there are examples of businesses that understand how they should integrate their resilience and business continuity plans with city teams. We've seen some good examples of this. For example, in the hotel industry, where large hoteliers own (or franchise) and operate lots of buildings, many of which are in coastal areas (and therefore vulnerable to coastal storms and storm surges), they employ a lot of people, and we know of examples that recognise the value of working with city and town authorities to jointly strengthen resilience.

Gareth: On your example of the hotel industry, this was an area I focused on in an initiative about resilience on small islands with my co-initiative owner, Rajeev Issar of UNDP, in 2021. We spoke with some hotel chain operators and independent hotel operators about this matter, and they talked about similar things.

Ben, there are of course lots of businesses involved in healthcare, too, and I imagine business involvement in healthcare resilience is important to factor into good disaster resilience.

Ben: I see an increasing level of involvement by businesses involved in healthcare. We are certainly seeing this in Nashville, as a lot of healthcare services in the US are coordinated through or have some form of touchpoint with Nashville. There is an ongoing dialogue on what businesses can do to help strengthen the resilience of healthcare systems. Belmont University opens up a medical school in mid-2024, which is named after Thomas F. Frist, Jr, who founded a large healthcare services company called [HCA](.).

An interesting area we are looking at right now, which could have some linkages with your initiative on avoiding disasters and certainly links to the thinking on smart cities, is the role of technology to help and support anticipatory and advance action.

Through the action guide process, we want to see how we can prioritise what is required and to develop plans and use the process to anticipate pre-emptive and early action. For example, any business should be able to benefit from good technology forecasting that helps them be prepared for a looming event such as a major storm or wildfire. Early warning can give them valuable time to ramp up personnel and staffing and take measures to protect their operations – and hopefully be in line with government action, as we discussed earlier. Peter mentioned the hotel industry just now, and the healthcare sector can probably learn from this industry.

There are other things we can do. For example, how we leverage wastewater surveillance for healthcare preparedness. Monitoring wastewater could help hospitals prepare for respiratory diseases and other communicable diseases, because it is a way of spotting potential problems early. Data indicates that there is usually about a two-week lag time from identifying a communicable disease in wastewater through to seeing people presenting at hospital because of these diseases.

From a healthcare system perspective, it's also important to think about what is required outside of the healthcare system in order for it to be resilient – again back to the systems of systems thinking and approach. To ensure specialists and hospital teams can do their job in a hospital, there's a lot more to it than ensuring they are in the operating theatres and on the wards. They need electricity, all their equipment, the PPE, all the supplies that come in, cleaning support and so on. If all these elements are not functioning, the hospital and healthcare system can fail. The action guide we have developed is deliberately asking people to focus on the interconnected systems (the "systems of systems approach)" to ensure that risk can be managed across the spectrum.

Peter: *One of the things I hope will come out of our work is to ensure that public healthcare is seen by all as connected to all other parts of an urban system – from the transport through to others. Too often it is seen as functioning by itself.*

Mobile and digital technology is an important point to think through. These technologies have incredible potential to help and support disaster risk action, and they also bring with them significant risks if they are not managed well. Mobile and digital technology is part of an overall solution, it is not the sole measure to use. There must be sensible back-up solutions. For example, for certain aspects of disaster resilience such as emergency warning systems, a range of communications channels are required, including old-fashioned ones, we should not rely on a digital technology such as a smartphone message or an app alert (which you won't receive if mobile networks are down or overloaded).

Gareth: On the technology side of things, I am imagining that Earth observations can help city and town authorities to prepare for potential events that can lead to disasters, by showing the threat of oncoming storms for example.

We have mentioned the systems of systems approach to the action guide a few times.

My work in urban resilience and sustainability is founded on a systems approach, so I am completely aligned to using systems thinking. To avoid a disaster if we can, or minimise the effect of

Ben: This ties into what Peter was saying earlier about the use of a systems approach to link public health systems into other parts of a city or a town's overall resilience. A paper we published in September 2023 is related to this point. It focuses on effective ways to apply the public health scorecard, and describes learnings taken from eight workshops – five of which were held in the US, two in Turkey and one in Slovenia. A common theme we found through the workshops is that public health must be integrated with other sectors for disaster and emergency preparedness to be effective. As an example of system linkages, consider the education sector and the effects of school closures (on public health). In the US, areas that had school closures for long periods of found that even when good online connectivity existed, the learning of students regressed. It is important to work out what can be done to keep society functioning in the safest possible manner during a crisis without causing long-term damage.

When we think about implementing manageable policies to deal with emerging diseases such as COVID-19, we have a lot to learn from the most recent pandemic. Consider as just one example the science of social distancing, which we learnt a lot about during COVID-19. A [study in Chicago](#) showed that reducing density in restaurants to about 20% of their normal capacity was a measure that was just as effective as closing them. To keep a restaurant open in a managed way, whilst appreciating that it may be just 20% of capacity so it still represents many challenges, could make a big economic difference in allowing businesses to survive. We talked about the importance of SMEs to urban centres earlier, and the majority of restaurants and cafés fit into the SME category (including many large chains, which are often run as franchised operations). If you keep restaurants open in a safe way, you provide social benefits for families being able to interact with each other in an appropriate way, as long as it is considered safe. My main point here is the importance of thinking very carefully about linking public health measures into and being balanced with societal measures and the overall urban system (a "system of systems").

We are also finding some interesting insights through our research into the priority healthcare needs to support disaster resilience. The highest priority solutions for cities and towns are often soft infrastructure solutions, including community engagement, rather than more bricks and mortar for hospitals. In the MCR2030 webinar that you attend, I gave an example about a facility in Cairns which is an example of being smart with scarce funding to bring a risk level down to an agreed acceptable level over a period of time to a community. In this example a health centre was built ([the Cairns South Health Facility](#)) for A$15 million dollars to support a disaster situation, rather than a new hospital,, AND also serve as a regular facility to provide community health services. We do not need the most extravagant and expensive solutions to manage disaster risk and provide disaster resilience; we need to bring the risk down to an acceptable level and be smart with the financial resources we have available.

Gareth: This example you have just provided about the Cairns South Health Facility and being smart with resources makes me think of some examples I have seen in Bangladesh (a case study in our Disasters Avoided initiative), in which pragmatic solutions for shelters that double up as facilities for regular use (be they schools, libraries or something else) supports disaster resilience. What's more, such centres are familiar to people, so they have a level of trust to go there to evacuate if they need to do so.

Being smart with scarce resources and looking at resilience using systems thinking means thinking about sustainability aspects, too. I wondered if we could also talk about resilience and sustainability. Do / can they go together all the time?

Peter: We have a program of work in place to explore the relationship between sustainability and resilience, and we hope to provide some guidance in this area. There are things we can do that are sustainable but not resilient, and there are things we can do that are resilient but not sustainable. There are things we can do that are both, sometimes. Some actions achieve very little for either goal. At different points in time, I may need to make a choice that fits into any of these four quadrants, including the one that does not achieve much for either.
For example, during a raging wildfire fire retardant will likely be sprayed in and around the affected area. This product can play a crucial role in people's survival, but it is not environmentally friendly. However, it is a defensible decision in the moment. When we take a longer view about being more sustainable and environmentally friendly, we should think very carefully about managing forests and other land areas better so that wildfires do not grow into the raging sizes that make them deadly. One (of many) outcomes of better forest and land management is that we reduce the number of times that response measures such as fire retardant are required, which is better for the environment and also saves on the cost of it. How we think about the balance of these matters is key.

Another example is the ongoing discussion about the use of grey infrastructure (our humanmade structures and engineering) and blue/green infrastructure (using nature-based solutions) for resilience. For cities to have resilience against widespread flooding, a combination of design measures may well be required – for which some of it will very likely need to be humanmade grey infrastructure (i.e. appropriate flood defence structures). On the specific threat of flooding, the rainfall quantities that we have recently seen and may continue to see in various parts of the world show us that sponge city natural solutions can play an important role, but we are likely also to need engineered solutions to be combined with them to deal with the threat of major flooding. It's about providing sensible solutions using all the options available to us.

Gareth: So, it's about working together and being intelligent with design. From the reviews I have undertaken for our Disasters Avoided initiative, I keep seeing how economics plays a crucial role in long-term decision-making, and how it directly impacts short-term actions that are good or bad towards the environment. In our case studies that are funded by NASA's Earth Sciences division, I see many examples of economic trade-offs being made.

I think the point you make about the right balance of grey and blue/green infrastructure is important. As an example of one case study, we have reviewed the flood resilience measures in Hamburg in Germany, and its HafenCity urban development, which are blend of grey and blue/green. Importantly, the demonstrate a mindset to avoid disasters, with good local governance in place and a societal cohesion along with using data wisely to take quick action when necessary. Another example that often comes to my mind is the [Bishan-Ang Mo Kio Park](#) in Singapore – an initiative which has grey and blue/green infrastructure, and it is a project for which the private sector has been instrumental (the global architecture, engineering and consultancy company Ramboll [were involved in it](#)). What used to be a straight concrete channel in this area of Singapore is now a meandering natural river and natural area, with the area being allowed to flood in periods of intense rainfall (they have alarms in place for when it gets very high). Yet it also has some grey infrastructure to it, to allow water to escape.

Peter: It is true that we can do a lot with nature-based solutions, when they are the right ones. They can add a lot of value, but we need to consider how they can work as part of an overall whole.

Gareth: It comes back to systems thinking, doesn't it. And related to this point, we need to consider the sustainability benefits of different humanmade solutions (traditional Portland cement, for example, is [a major source of carbon emissions](#))

Ben: Another aspect to consider with the scorecard action guide, which we have discussed in some workshops in Dallas and Turkey is the need to strengthen eco-systems. Relating to community engagement (the second chapter of the action guide), an interesting area of focus is looking at non-traditional engagement approaches, external to the government. This includes reviewing and understanding the role that faith-based organisations can play – which can be significant. This helps us to think about non-traditional communications and engagement methods we can use that can go alongside government action. In some parts of the world, and perhaps at different points in time as well, government officials may not be the best and most popular people to present a message about disaster resilience and to discuss things with communities. To optimise engagement, we should think about which key groups / stakeholders exist in a community, and can we train and work with them so that they, with their own input also, can be equipped with good data and tools and techniques such as systems thinking, so that what they discuss resilience with the people in the community who trust and listen to them, the message gets across in the best possible way. You often see community leaders stepping up in times of crisis and emergency – there may be a person in a local area that people listen to who is not the mayor, they may be a community spokesperson that others listen to.

Gareth: I have seen some good examples of this in action in Bangladesh. Local volunteers play a significant role in effective early warning and avoidance of disasters.

Peter: As Ben mentioned just now, this is a core part of the community engagement chapter that we have written for the action guide. A core tenet of this chapter is that communication is two-way. We describe it as a U-shape model. On one side of the U there is communication by government / city authorities with its citizens, on the other side there is feedback from citizens to government / city authorities. The "magic" happens at the bottom of the U, where communication works fluidly side to side, and people engage with each other. Government / city authorities can stimulate this communication if it is smart, but they don't own it. To get effective communication going, there can be a range of options that might not be immediately apparent. Non-traditional communication channels may include a local football club, say, or a church.

Ben: A lot of the feedback we have received is that we need to include non-traditional communication channels in our resilience planning in many ways. Consider, for example, how aide such as food is set up to be distributed. When everything is normal, people get their food from traditional sources such as convenience stores and supermarkets. When a disaster occurs, we may see a decision made by the government / city authority to bring in food supplies. The U-shape model can be used by government to give food and supplies to the local community – an example of using the bottom of the U and facilitating community action. Local people know how to distribute aide best in their areas. They know the local roads, who has the most pressing needs, who can help with local deliveries – quickly. This is an example of what the action guide is seeking to help people who are involved in resilience planning – how to enable government and communities to work together to minimise impacts of disaster events, and when we can, to help avoid disasters.

Gareth: And hopefully this type of approach can help government with its regular communication and engagement with citizens in normal times, to get good engagement going with citizens (which is something I cover in my urban resilience work). I can see the U-shape model applying to government / city authorities and businesses also (we talked earlier about how SMEs are the heartbeat of most urban centres).

Peter: A hobby horse I have is that we have an opportunity to think about and plan a lot of post-event recovery in advance – and we should do so! For example, in the aftermath of a wildfire or a hurricane, you know that you will have trees down. Can we agree a Memorandum of Understanding (MOU) with one or more organisations (probably businesses) to agree a price in advance so that they can come in and quickly clear these trees, to free up infrastructure – and do so in a way that is predictable, because someone has thought about it beforehand. This relates to our earlier discussion point about businesses and their business continuity plans and linking up with government. Or again, we know that in the event of having to deal with a wildfire, fire retardant will get into the local water network, so strike an agreement in advance with a business / specialist to be able to flush it out as soon as practically possible after an event.

Gareth: This is essentially the model of how I understand resilience planning works in Japan, which – importantly – includes testing that these arrangements can and do work, not agreeing it and then forgetting about it / not knowing about it when something happens and a response is required.

Peter: We talked about the Japan model being a good one. And yes, you may need to renegotiate it every year, and that's fine.

Ben: This type of forward thinking stimulates a local economy, too.

Gareth: These examples remind me of a graph I often use in business continuity with businesses:
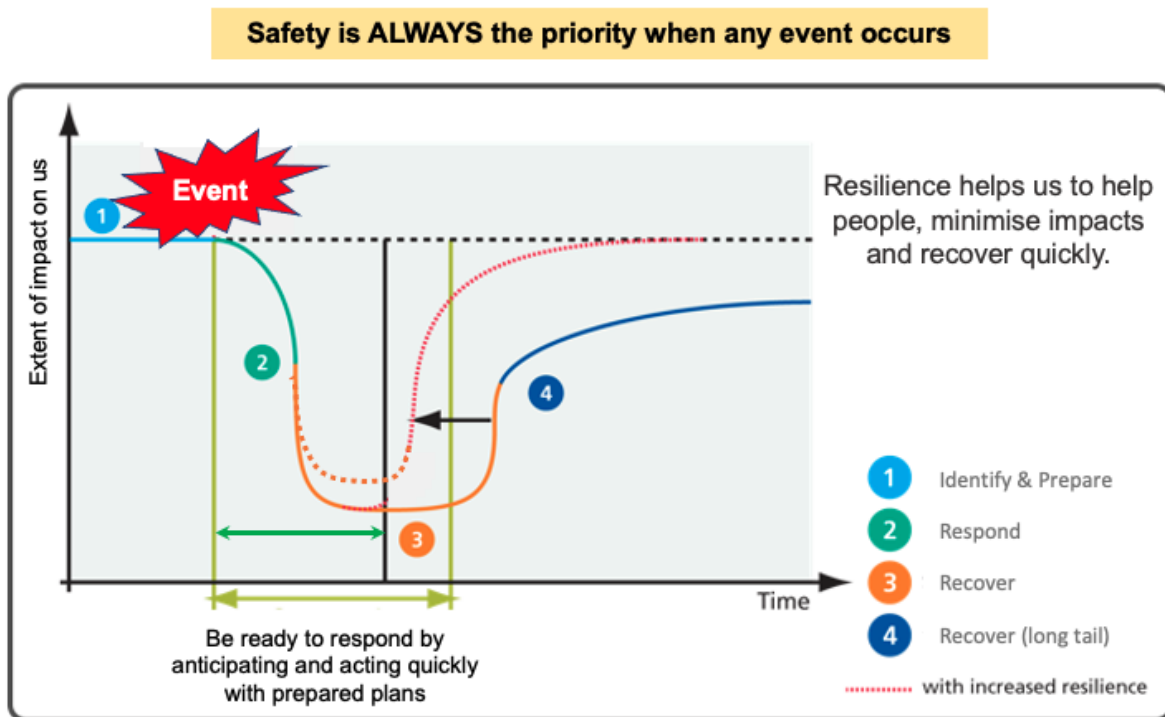
Business continuity focus points. Image from: G Byatt

Peter: As another example, consider the commercial (and communal) infrastructure in small towns and small rural communities. There may be one building that serves multiple needs, including a convenience store, an ATM and maybe a bank. Such a building needs to be designated as a high priority building to have good resilience against disaster threats. If it burns down or is flooded, it means a major economic hit to the local area. So, whoever operates it should have a good resilience plan. The same thing is true for the local health clinic. If it burns down or floods, people may have to travel a long way for important healthcare needs until a new clinic is organised. Start leaning on your local healthcare providers and your banks to ensure they are planning for disaster threats.

Loss adjusters are a key group of people in the event of a disaster. So often, there is a shortage of loss adjusters, especially those that know the local area. Can we get this lined up in advance on a contingency arrangement?

If city / local government offices are taken out of action, how will the city / town continue to function? Think about how a back-up can be provided – either in a different building or perhaps by a business.

Start thinking about what you will need afterwards - in advance!

Gareth: I wonder if some cities can strike up arrangements with each other, to offer resilience services to each other if one of them is hit badly? Also, this relates to business BCPs, they can be done in isolation, or they can be done with a systems approach.

Ben: This is part of what the scorecard action guide is designed to help people with. Go through the scorecard, invite lots of diverse groups of people to get together to rank and prioritise what you think you need to do (which might change depending on a specific situation), and then apply systems thinking to design programs or actions that use systems of systems thinking. The idea is to provide a range of options, could be 5 or 6, and recommend how to move forward and why, and stress that they are interconnected. If we can be on the front foot going to decision-makers, we can help to avoid disasters.

Gareth: And some of them are the softer infrastructure ones…

Peter: Stress counselling and mental health matters are another important area to focus on. They are key to societal resilience, and we have to ensure there is support in place when it is needed.

Thank you very much for a fascinating discussion, Ben and Pete. I really appreciate it. I look forward to seeing how your ongoing work for the scorecard action guide, and other activities towards healthcare resilience and the ARISE network continue to move forward.