

A story of contrast Taiwan vs USA but also Resilience Engineering vs High Reliability Organizations Theory.

REA Special Webinar Series on COVID-19 Talk 03.

Webinar and summary prepared by Sheuwan Chuang (Taiwan), Laurin Mooney (USA), David Provan (Australia), Elizabeth Lay (USA), Ivonne Herrera (Norway)

The webinar¹ was hosted by David Provan from Safety Science Innovation Lab at Griffith University, Australia. The speakers were Sheuwan Chuang, health care researcher at Taipei Medical University and resilience engineer who also works part time with the OSU lab in the USA. Laurin Mooney is nurse and HRO Coach. Laurin works on helping people understand and integrate High Reliability Organizing into their work in a fast, fun and actionable way. She is the founder of Be Highly Reliable LLC.

Laurin shares her experience through the lens by a person that is very involved in high reliability organizing. The talk is shaped by her work in emergency departments and off shift supervision, which provided many occasions for **managing the unexpected**. High reliability is about recognizing and responding to **weak signals**. The COVID-19 response in China was a strong signal, that something was very wrong. I watched news from many countries to gain **diverse perspectives**. Then, her husband, a dentist, received a call asking if it was possible to send 4000 masks to China so factory workers could return to work. It was then we realized no masks were available in the USA. All this information contributed to the **sensemaking process**. Laurin shared that one the most important gifts from HRO is a reminder on how critical sensemaking is for success and safety. Her focus is **the moment right at the beginning of the event** when the weak signals are first available and what is happening in the individual's mind and between minds. At the beginning in the US, there was no concern. At our local hospital, we have like 6 ICU beds and 3 ventilators for 85,000 people, so she was concerned about access to care. A week before pandemic was declared, big grocery stores mentioned that they were receiving a lot of emails, but not really acting. What shocked Laurin is how people pushed away new information. There is still the **lack of ability to imagine something that is outside of everyday events**. What does this mean moving forward? This mindset is still in play. **We need to look at safety backwards and safety forward but that moment in between is powerful and my hope is that we improve our skills in that area.**

Dave summarizes how Laurin as a health care professional with expertise in HRO, and weak signals, was able to understand the context and had the **ability to create foresight**. David Woods would say "*as soon it becomes obvious that you need to make a decision, it is too late*". So **HRO teaches about how to look for different signals in the environment and make sense of this information** before it is too late.

Sheuwan thinks this time the COVID-19 happened in Taiwan, the whole society was prepared to re-experience a new pandemic. Sheuwan would like to highlight three things to introduce Taiwan's experience. First, the status of the COVID-19 pandemic is presented. Second, the response within Taiwan. Third, based on her studies of the Formosa fire², Sheuwan discusses disaster resilience the event with disaster resilience lenses. COVID-19 event is different from every day. Sheuwan thinks disaster resilience is better to explain a situation for pandemic events.

- Status: From January to April, there are 439 confirmed cases, 343 imported, 55 locals acquired and 31 from a combat support ship, 6 death). All these cases are categorized in different waves, first wave from January to March 15. After March 15, there is an increase from 55 to 439. At the beginning was Taiwanese people returning from China and few cases local acquired. The second wave, people come from overseas Europe and America, and confirmed cases increased. We are expecting a third wave, community outbreaks.

We have different strategies to prevent and to control the spreading.

¹ Video and handout for the session are available at: <https://www.resilience-engineering-association.org/seminars/>

² Chuang, S., Ting, D., Cook, R. (2017). Resilience at scale in mass causality response: The Formosa fun coast fire. 7th Resilience Engineering Symposium Liège, Belgium.

- First wave, ***the previous Severe Acute Respiratory Syndrome (SARS) experience influenced individuals, hospitals and government to be very sensitive.*** We learned how to act when we noticed the signal from China. So, individuals started wearing masks and washing their hands. This ***means people are alerted to prepare and to control*** these barriers.
- When the first wave changed into the second wave, the total number of visited and admitted patients in hospitals is reduced to 10-20%. This means that people started to think "we better no need to go to the hospital" ***and do trade-offs to not going to the hospital, better being uncomfortable with illness rather than being infected.*** The public made trade-offs. All this experience comes from SARs. Because the SARs in 2003, we lost people because we did not know that the SARs was so transmittable between people. During the covid-19 pandemic, people started to protect themselves automatically. We think that this is a major reason that Taiwan have low confirmed cases. ***The hospitals started to re-configure their patient layout,*** the suspicious cases and the confirmed cases are in different areas. The health care workers know where contains infected, where are suspicious cases. The hospitals adapted regular operations to manage care and information to prevent hospital acquired infections. ***The government also learned, at the first index case was confirmed and the government started the red flag from China to Taiwan.*** The society are all alerted, all prepared to protect themselves. When the pandemic has been spread globally and many people returning from overseas, Taiwan observe other countries, the government gradually made more restrictions on the people, i.e. social distancing, mandatory wearing mask, and more strict infection control by hospitals, isolating and monitoring suspicious cases, and extending test suspicious cases more, so we have now a slow increases and good local control. Because there are people who are infected but not sick can transmit, so we are preparing for the third wave. During webinar preparation, Sheuwen mentioned that people is informed where people infected is located (APP) and create a collective foresight and respond earlier.

Shuewen summarizes Taiwan experience in three categories: 1) People are capable to organise themselves and learning from past disasters. People can react and prepare for the future one "*We can learn and organise ourselves*". 2) People can anticipate the future and the risk and prepare for future challenge. 3) Coordination between individuals, between government, private, public sectors and public. This includes leadership, partnership, collaboration, decision-making and trade-offs.

Dave: ***how can we create foresight when you have not experienced an event?*** From audience: ***Can we say that this collective emotionally connection make better reaction in Taiwan versus a rational collection of information?***

Sheuwen: A real case contributes to strong experience and collective experience in the whole society. This is very powerful. The sense making from previous disaster experience can work in supporting the future one. Laurin: People want data before can act but we do not have evidence on the way people wants information. Sometimes you just must see that the boat is sinking and act.

Sheuwen: Example from two hospitals: A case that you could not tell that the person was infected perhaps a seasonal flu. The physician threatened him immediately as COVID-19 and isolated this person immediately, later the patient was confirmed as covid-19. Another hospital threatened a similar case as a seasonal flu and then 8 persons were infected in the hospital. After this event, hospitals informed each other and support each other to be better prepared. Information sharing is not only between individuals but organisations.

How you see HRO and RE? In Laurin's view, HRO is very relevant in terms of effective early response. Unfortunately, she did not experience many concrete examples in the US. Dave reflected that one organisation in Australia, early in the COVID-19, moved to have 50% of people at home and 50% in the office but besides that there were very little reactions. Shuewen's reflects that resilience engineering is about building and sustaining the capability to act. People can do things that are reliable, but resilience for adaptations, we do not know if these adaptations are reliable or not. Dave proposes a very simplified summary, Resilience Engineering is a potential related adaptive capability of the organisation while HRO is about what you can see so you know you have to adapt. Perhaps these lenses are more complementary that we think.

What do you see post pandemic control, how this recovery will look like Sheuwen: I think that everyone is waiting for vaccine and we are getting ready for the third wave. I see coordination across governments and organisations, and building ways and different strategies in the event. I still think that Resilience thinking can support people in different periods with different strategies and actions. Laurin: **At this point, we do not know.** Do you want to talk about what other countries are doing and what you think about that? South Korea is doing a very good job in testing. But no one was too much time to do comparison because we are all very busy fighting the pandemic.

As a comparison between Taiwan to USA, Dave concludes by citing Beth "**always respond strong to weak signals**".