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Typhoon Haiyan was extraordinary with wind speeds of 195mph – the third strongest on record. However, historical records have shown that such super-storms are not unprecedented in Asia. **Mr Robin Johnson** of **AIG** explores the implications for the future.

15 years ago, a rural Australian newspaper reported in an article entitled “Typhoon and Tidal Wave in the Philippines” that “7,000 lives [were] lost... many being drowned by the rush of water, while others were killed by the violence of the wind... The hurricane reached Leyte on October 12, [1898] and striking Tacloban, the capital, with terrific force, reduced it to ruins in less than half an hour... At Gamo the sea swept inland for a mile... The town of Hermin was swept away by flood, and its 5,000 inhabitants are missing.”

Typhoon Haiyan, the tragic storm which hit the Philippines on Nov. 8th last year, killing almost 6,000 people, has been characterised by the media as unprecedented and by implication unforeseeable, a product of global warming that presages more extreme super storms to come. Is this a rational assessment, and if so, what are the implications?

Haiyan does have precedent

Haiyan is indeed extraordinary. Its sustained wind speeds of 195mph are the third strongest on record, and the strongest for any storm making landfall. AIR Worldwide estimated property damage of US\$14.5 billion, and insurable losses of \$300-\$700 million, in a relatively unpopulated region.

Had the storm hit New York, its 20-foot tsunami-like storm surge (50% bigger than Hurricane Sandy, the second most costly storm in history) would have caused half a trillion dollars of damages, according to Dr Jeff Masters, Director of Meteorology at Weather Underground.

But as the newspaper headlines of 1898 revealed, Haiyan does have precedent.

Destructive storms have struck Tacloban before

Indeed, just 15 years later, in 1912, the now-defunct Washington Herald reported, in an article entitled “15,000 die in Philippines storm” that Tacloban had been “practically destroyed” by a typhoon which had also “wrought enormous damage and loss of life at Capiz” with “half of the population of the two cities lost”.

Tacloban has been destroyed by typhoon and storm surge three times in the past 116 years, making this an event with significant precedent, if no less tragic for this fact. In this respect, the media’s focus on record-beating wind speeds, with the implication that typhoons are worsening, may be misleading, as scientific Pacific wind speed records barely stretch back 50 years, giving little context.



Tacloban City – Millions were left homeless after Typhoon Haiyan.

Better constructions and early warning systems in place

Historical records are littered with evidence of tremendously destructive storms in Asia, and these may provide an indication of what may lie ahead, although Asia's industrialisation and urbanisation over the past few decades will inevitably mean that modern iterations of these storms will have very different outcomes.

On the one hand, substantial improvements in building construction, coupled with sea defences, early warning systems and mass evacuation plans should - in theory - make for a safer environment. A repeat of the direct hit suffered from the 1906 Hong Kong Typhoon, for instance, would be unlikely to cause a repeat of the estimated 10,000 deaths suffered, the vast majority of which occurred amongst the estimated 20,000 people who lived and worked at sea and who received too little warning to make it ashore. The waterborne population of modern Hong Kong is miniscule in comparison, and warnings are issued days in advance.

Impact of storms could also worsen

On the other hand, rapid coastal development and migration may exacerbate the impact of these storms. A study published in *Weather* magazine suggested that a repeat of the "Terrific Tongking typhoon" of October 1881 would have catastrophic implications for Vietnam.

This storm took a unique trajectory for a South China Sea typhoon, intensifying after it passed over Luzon, and then dodging Hainan Island (whose mountains normally dissipate typhoons) turning north up the Gulf of Tonkin to bear down on Haiphong in Vietnam at full strength, killing 3,000 people, or approximately 20% of the population, with its 165km/h winds and 3m storm surge.

With a population of 1.9 million, Haiphong is now Vietnam's third largest city, one of Southeast Asia's largest deep water ports, and sits at the head of the Red River Delta industrial corridor which stretches all the way to Hanoi.

Researchers suggested that a repeat of the 1881 typhoon would see a storm surge inundating this industrial corridor deep inland, travelling along distributary channels in ways similar to that seen in Cyclone Nargis, which killed 138,000 people in Myanmar in 2008. With upstream drainage restricted by the surge, even Hanoi could experience widespread flooding.

Pearl River Delta exposure

The low-lying mega-industrial park that is the Pearl River Delta, with 120 million inhabitants and a GDP of over US\$750 billion, stands similarly in the path of typhoon tracks. Whilst it has not sustained a direct typhoon and storm surge hit since the 1979 formation of the Special Economic Zone, the region has been hit by several such storms in the past 150 years.

The 1862 Canton Typhoon, whose eye passed directly over Guangzhou, drawing an eight-foot storm surge with it, killed 37,000. A little way up the coast, the 1922 Swatlow Typhoon killed 100,000 in what is modern-day Shantou, with eyewitnesses describing a storm surge which destroyed villages 200 miles inland, so that "it was several days before the country drained off, and meanwhile the tides appeared to lose their rise and fall, the surface current flowing to seaward nearly all the time, and the general level remaining above normal".



Unmodelled risks

The media's focus on worsening weather trends may well be misplaced. Asian history has always been shaped by typhoons, as far back as the destruction of Kublai Khan's invasion fleet off Japan in 1273, and these storms will continue to have extreme effects on our society. Given Asian coastal urbanisation, the potential severity of outcomes has intensified, and with global supply chains concentrated on immense Asian industrial parks, future super storms could now have world-changing impact.

Despite this, CAT models remain remarkably underdeveloped in Asia. Whilst wind models have increasing coverage, flood and storm surge remain practically speaking unmodelled, leaving the insurance industry and its clients in the dark about the true extent of the risks faced.

Getting clients back to their business faster

To combat this, in the past few years, AIG has invested heavily in engineering and analytics to help clients understand and protect themselves against these types of unmodelled risk.

We have opened an advanced multi-disciplinary analytics and modelling Centre of Excellence in Bangalore, which aggregates a broad array of data to gain insights into CAT exposures in the region, including unmodelled perils such as flood and storm surge.

Our worldwide, world-class loss control engineering team leverages these insights to quantify a client's vulnerability to potential natural catastrophe exposures. This strategic service helps clients prepare optimal target response plans and investments. We provide cost-sensible recommendations to mitigate natural hazard exposures, including structural and operational risk improvements.

And to deliver on our promise, we have developed claims protocols which leverage our unrivalled history of handling complex CAT claims around the world – from Tohoku Earthquake and Tsunami to Hurricane Sandy, Christchurch Earthquakes to Thai Floods – to get our clients back in business faster.

With this team behind them, we are confident that our clients can safely say: "Bring on tomorrow".

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