

CityUHK and Global Climate Experts Warn: El Niño Poised to Severely Impact Hong Kong's Economy and Health

[March 2, 2026](#)

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A groundbreaking study spearheaded by City University of Hong Kong (CityUHK) alongside collaborators from Nanyang Technological University in Singapore has unveiled the profound and prolonged effects of El Niño events on human health, life expectancy, and economic stability. Published in the prestigious journal *Nature Climate Change*, this research challenges prior assumptions by revealing that strong El Niño episodes impose lasting damage beyond the immediate climate disturbances, effectively halting progress in mortality reduction for years following these phenomena.

The comprehensive study analyzed extensive datasets spanning six decades and covered ten Pacific Rim nations, including economically advanced and resource-rich entities such as Australia, Japan, the United States, Singapore, and Hong Kong. The findings paint a sobering picture where El Niño events are not merely transient climate anomalies but catalysts that exacerbate mortality rates significantly during and following their occurrence. This impact, in turn, culminates in slowed improvements in population health metrics, notably life expectancy.

El Niño, characterized by oscillations in sea surface temperatures across the central and eastern Pacific Ocean, triggers broad-reaching and severe weather anomalies like unprecedented floods, intense heatwaves, and amplified air pollution levels. These disruptions ripple through environmental and societal frameworks, undermining food security and curtailing economic growth, thereby exacerbating vulnerabilities on a global scale. Indeed, the study emphasizes the multifaceted nature of El Niño's assault on well-being, portraying it as a nexus where climate and health crises intertwine.

The vulnerability escalates for populations already at risk, particularly children and the elderly, who face disproportionate exposure to El Niño's deadly consequences. Infections, diarrheal diseases, cardiovascular stress, and respiratory ailments surge amidst compromised healthcare infrastructures, aggravated by extreme weather events. The study highlights that these health repercussions are not fleeting but trigger extended periods of excess mortality, effectively eroding life expectancy benchmarks previously attained through decades of medical and social advancement.

Notably, the research isolates the two most potent El Niño episodes in recent history—in 1982–83 and 1997–98—as inflection points that drastically impaired human longevity and economic prosperity. The 1982–83 event alone is credited with reducing life expectancy by nearly half a year on average across the studied regions, imposing an economic burden estimated at a staggering US\$2.6 trillion. The subsequent 1997–98 El Niño event was similarly devastating, curtailing life expectancy by roughly one-third of a year and inflicting economic damage approximated at US\$4.7 trillion.

Hong Kong's experience during these significant El Niño years mirrors the regional averages in terms of mortality impact but reveals striking economic ramifications on a localized scale. The 1982–83 episode alone translates into a loss of approximately 0.6 years of average life expectancy for the Hong Kong population, symbolic of an economic setback close to US\$15 billion. Similarly, the 1997–98 event cost the city an estimated 0.4 years of life expectancy, correlating with a financial loss soaring to around US\$58 billion. Such localized insights provide a granular lens to assess the breadth of El Niño's toll.

CityUHK's Professor Benjamin Horton, one of the study's lead authors and Dean of the School of Energy and Environment, emphasized the broader implications of these findings. Though the current analysis does not offer precise, localized future forecasts, it delineates a grim trajectory. By extrapolating population scales and economic metrics, the team projects that Hong Kong could confront cumulative economic damages between US\$250 billion and US\$300 billion through the 21st century if El Niño events intensify as climate models suggest. This projection underscores the critical need for forward-looking mitigation strategies.

Gut health supplements

On a broader scale, intensifying El Niño events have the potential to slash life expectancy by up to 2.8 years across the studied Pacific Rim regions by century's end, tying this human health setback directly to economic losses estimated at a colossal US\$35 trillion globally. These figures compel a renewed urgency in understanding and adapting to the longer-term ramifications of climate phenomena previously treated as episodic occurrences with transient impact windows.

Professor Horton underscores that El Niño events, unlike many other natural disasters, possess a degree of predictability. This characteristic offers a crucial opportunity for policy makers and public health authorities to implement effective, anticipatory interventions. Vital measures include strengthening early-warning systems to alert populations ahead of extreme weather, establishing heat-health action plans tailored to vulnerable groups, and deploying advanced water management techniques to cope with drought and flooding cycles.

Moreover, adaptive infrastructure and smarter agricultural practices are critical to mitigating El Niño's multifaceted assault. Investments in resilient urban planning, flood defenses, and sustainable farming methods geared to withstand heatwaves and erratic rainfall patterns can buffer socioeconomic systems against the shocks wrought by climate extremes. Simultaneously, bolstering healthcare systems to rapidly respond to surges in infectious diseases and pollution-related morbidities remains a paramount priority.

This study also reveals a cascading chain of consequences that extend beyond immediate physical health impacts. The disruption of food security channels exacerbates nutritional deficits and heightens susceptibility to chronic illness. Economic setbacks constrain public budgets, limiting resources for social welfare programs and health services, while increased morbidity burdens workplaces and communities alike, amplifying disparities along socioeconomic lines.

By shining a spotlight on the persistent effects of El Niño events over decades, this pioneering research reframes the phenomenon as a significant public health challenge intertwined deeply with climate change. The active engagement of interdisciplinary teams employing sophisticated statistical analyses has bridged the gap between climatology and epidemiology to articulate actionable insights for a warming world grappling with intensifying natural hazards.

Together, these findings galvanize a paradigm shift in the global approach to climate resilience, emphasizing the integration of health outcomes within environmental risk frameworks. Proactive, coordinated, and science-led strategies targeting El Niño's enduring impacts can potentially safeguard population health, curtail economic losses, and protect the most vulnerable communities from the ravages of climate variability.

The enduring imprint left by historic El Niño episodes offers a vital scientific basis to inform policy discourse and investment priorities. Addressing this challenge demands sustained commitment from governments, researchers, and civil society alike to innovate, adapt, and future-proof societies against the scaling threats posed by a changing climate. The path forward hinges on harnessing predictive capabilities to anticipate crises and deploying multi-sectoral resilience mechanisms to shield life expectancy gains and economic stability from climate perturbations.

Subject of Research: Not applicable

Article Title: Enduring impacts of El Niño on life expectancy in past and future climates

News Publication Date: 9-Jan-2026

Web References: <http://dx.doi.org/10.1038/s41558-025-02534-4>

References: Published in *Nature Climate Change*

Keywords: Climate change, El Niño, life expectancy, mortality, economic losses, Pacific Rim, extreme weather, public health, resilience, climate prediction

Tags: [air pollution and El Niño](#)[City University Hong Kong climate research](#)[climate change and population health](#)[economic stability and climate anomalies](#)[El Niño effects on human health](#)[El Niño impact on Hong Kong economy](#)[El Niño-induced weather extremes](#)[food security risks from climate change](#)[life expectancy decline due to El Niño](#)[long-term consequences of El Niño events](#)[mortality rates and El Niño](#)[Pacific Rim climate studies](#)