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EDUCATION

2002/08 - 2007/01 Ph.D. Institute of Environmental Health, National Taiwan University, Taiwan

2000/08 - 2002/07 M.S. Institute of Environmental Health, National Taiwan University, Taiwan

1996/08 - 2000/07 B.A. Depart. of Environmental Science, Tunghai University, Taiwan

EMPLOYMENT

2017/08 - present: Professor and Chair Depart. of Environmental Engineering, Chung
Yuan Christian University, Taiwan

2013/08 - 2017/07: Associate Professor Depart. of Environmental Engineering, Taiwan

2013/08 - 2016/01: Section Director Center for Environmental Protection and
Occupational Safety and Health, Chung Yuan Christian University, Taiwan

2007/08 - 2013/07: Assistant Professor Depart. of Environmental Engineering, Chung
Yuan Christian University, Taiwan

HONORS & AWARDS

2000 The Phi Tau Phi Scholastic Honor Society of Republic of China

2020 Excellent Cooperative-Education Award, Chung Yuan Christian University, Taiwan

PROFESSIONAL SERVICE

NA

RESEARCH INTEREST

My research focused on association analysis between weather variations, ambient air quality and risk of infectious diseases, such as diarrhea, infectious gastrointestinal disease, enterovirus infection/complicated illness, eye disease/conjunctivitis, skin disease and influenza. In addition, assessments on temperature indices and mortality and morbidity risks of Taiwanese population in association with prolonged extreme temperatures event (heatwave and cold spell) were also the focus of my research. I tried to transform my research findings into practical applications and interface with governmental priorities. I expanded the temperature-health risk

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association study from using historical observations to real-time, seasonal and long-term predicting weather/climate data and to make practical applications of climate services in the field of public health. For years 2017-2020, my research team systematically evaluated the area-sex-age stratified disease-specific (more than 100 diseases categories) health risk associated with ambient environment using 23 million population-based vital statistics and national health insurance claims. Risks of hourly ambulance services associated with total fine particulate matter and its constituents were also evaluated. In the next few years, I will cooperate with investigators from Sweden and the United States, and partners from the Asia Pacific Region (India, China, Vietnam, Nepal, Bangladesh, and Indonesia; referred to as the focus area) to establish a multinational consortium of scientists that will perform a comparative analysis of diarrheal disease risk associated with extreme weather events. Our consortium will develop a transferable solution — seasonal to sub-seasonal (S2S) early warnings for diarrheal disease — that will be implemented across the focus area to reduce extreme weather-related diarrheal disease burdens and improve community resilience to climate change.

RESEARCH HIGHLIGHTS

1. Addressing Extreme Weather Related Diarrheal Disease Risks in the Asia Pacific Region (AWARD-APR), 2020-2023

Diarrhea, highly associated with ambient rainfall and temperature, is the second leading cause of death in children under the age of five. Even though the mortality from diarrhea is rare, annual hospital admissions of diarrhea are about 7 million in Taiwan. This study, under Belmont Forum ‘Climate, Environment and Health’ Collaborative Research Action, proposal “Addressing Extreme Weather Related Diarrheal Disease Risks in the Asia Pacific Region (AWARD-APR)”, aims to evaluate the associations among extreme weather events, El Niño Southern Oscillation phenomenon, and mortality from and morbidity of diarrhea in the multinational consortium, including Taiwan, India, China, Vietnam, Nepal, Bangladesh, and Indonesia. A seasonal to sub-seasonal early warning system and education program for weather associated diarrhea risk would be developed and delivered to participating countries.

2. Direct and Indirect Health Effects for Vulnerable Population in Association with Extreme Weather Events in Taiwan, 2019-2022

Taiwan government authorities lack scientific evidence of health risks of susceptible sub-populations, such as elders, patients with chronic diseases, newborns and infants, pregnant women, and outdoor laborers, in association with extreme weather events. This 3-year study aims to evaluate the health risks associated with extreme weather events (extreme temperatures, rainfall, and drought) for susceptible sub-populations using daily vital statistics, daily national health insurance claims, and hourly emergency medical services for whole population in 6 major

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cities, namely Taipei City, New Taipei City, Taoyuan City, Taichung City, Tainan City, and Kaohsiung City, in Taiwan. A Gender-stratified comparative analysis would be included in this study. The second year plan will focus on associations between prolonged extreme rainfall and drought events and risks of enteric infectious diseases and accidents. In addition, temperature-health associations for various job types' labors, and labor force loss associated with extreme weather events would be assessed. In the final year of the project, precipitous labor and sudden infant death syndrome in association with extreme temperatures would be evaluated. Moreover, the modifying effects of 293 socioeconomic factors on temperature-health risk associations for susceptible sub-populations would be identified. This 3-year study will illustrate the spatial vulnerabilities for extreme weather events related health risks in 6 cities, and provide the scientific evidence and data to Ministry of Health and Welfare, Taiwan Environmental Protection Administration, and Ministry of Labor to make adaptive plans.

3. Health Effects Associated with Long-term Exposure to Mass and Constituents Concentrations of Ambient Fine Particulate Matter, 2021-2023

Short-term adverse health effects of PM mass and constituents have been evaluated for extreme high concentration event, e.g. Asian dust storm, or in a worst air quality city in Taiwan. However, the mortality and morbidity risk under long-term PM exposure is rarely studied. In 2021-2023, my team will conduct the longitudinal analysis of the associations between long-term air pollution (total PM_{2.5} level and its constituents) exposure and risks of age-sex-stratified area-disease specific mortality and morbidity using Taiwan population-based vital statistics and National Health Insurance Research Database. Standard Cox proportional hazards model and random-effects meta-analyses would be adopted for area-specific and island-wide integrated risk analysis, respectively.

REPRESENTATIVE PUBLICATIONS (*: corresponding author)

1. **Wang YC**, Sung FC, Chen YJ, Cheng CP, Lin YK. 2020. Effects of extreme temperatures, fine particles and ozone on hourly ambulance dispatches, *Science of the Total Environment* (in press).
2. Lin YK, Sung FC, Honda Y, Chen YJ, **Wang YC***. 2020. Comparative Assessments of Mortality from and Morbidity of Circulatory Diseases in Association with Extreme Temperatures, *Science of the Total Environment*, 723, 138012.
3. **Wang YC[#]**, Lin YK[#], Chen YJ, Hung SC, Zafirah Y, Sung FC*. 2020. Ambulance Services Associated with Extreme Temperatures and Fine Particles in a Subtropical Island. *Scientific Reports*, 10, 2855. Available at: <https://doi.org/10.1038/s41598-020-59294-8>.
4. Lin YK, A. T. Maharani, Chang FZ, **Wang YC***. 2019. Mortality and Morbidity Associated With Ambient Temperatures in Taiwan. *Science of the Total Environment*, 651, 210-217.

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5. **Wang YC**, Chen YC, Ko CY, Guo YL, Sung FC*. 2018. Pre-existing comorbidity modify emergency room visit for out-of-hospital cardiac arrest in association with ambient environments. *PLoS One*, Available at: <https://doi.org/10.1371/journal.pone.0204593>
6. Chen CC^{1,2,*}, Wang YR¹, **Wang YC**^{3,†}, Lin SL⁴, Chen CT⁴, Lu MM⁵, Guo YL^{6,*}, Projection of future temperature extremes, related mortality, and adaptation due to climate and population changes in Taiwan, *Science of the Total Environment* (in press).
7. Putri MSA[#], Lin JR[#], Chiang Hsieh LH, Zafirah Y, Andhikaputra G, **Wang YC*** (2020, May) Influencing factors analysis of Taiwan eutrophicated reservoirs, *Water*, 12(5), 1325.
8. Jung CC, Hsia YF, Hsu NY, **Wang YC**, Su HJ* (2020, Aug). Cumulative effect of indoor temperature on cardiovascular disease-related emergency department visits among older adults in Taiwan, *Science of the Total Environment*, 731, 138958.
9. **Wang YC**[#], Lin YK[#], Chen YJ, Hung SC, Zafirah Y, Sung FC* (2020, Feb). Ambulance Services Associated with Extreme Temperatures and Fine Particles in a Subtropical Island. *Scientific Reports*, 10, 2855. Available at: <https://doi.org/10.1038/s41598-020-59294-8>.
10. Widiana DR, **Wang YC***, You SJ, Wang YF (2019, Jun). Source apportionment and health risk assessment of ambient volatile organic compounds in primary schools in Northern Taiwan. *International Journal of Environmental Science and Technology*, 16, 6175–6188. Available at: <https://doi.org/10.1007/s13762-018-2157-1>.
11. Chen CC, Wang YR, Guo YL, **Wang YC**, Lu MM. (2019, Feb). Short-term prediction of extremely hot days in summer due to climate change and ENSO and related attributable mortality, *Science of the Total Environment*, 661, 10-17.
12. Putri MSA, Lou CH, M. Syai'in, Ou SH, **Wang YC*** (2018, Oct). Long-Term River Water Quality Trends and Pollution Source Apportionment in Taiwan. *Water*, 1394, w10101394.
13. **Wang YC**, Chen YC, Ko CY, Guo YL, Sung FC* (2018, Sep). Pre-existing comorbidity modify emergency room visit for out-of-hospital cardiac arrest in association with ambient environments. *PLoS One*, Available at: <https://doi.org/10.1371/journal.pone.0204593>.
14. Chao HP; **Wang YC**; Hai Nguyen Tran (2018, Aug). Removal of hexavalent chromium from groundwater by Mg/Al-layered double hydroxides using characteristics of in-situ synthesis. *Environmental Pollution*, 243, 620-629.
15. Chen YC, Huang YL, Ho WC, **Wang YC**, Yu YH (2017, Apr). Gender differences in effects of obesity and asthma on adolescent lung function: Results from a population-based study. *Journal of Asthma*, DOI: 10.1080/02770903.2016.1212367.
16. **Wang YC***, Lin Chitsan, Lin YK, Wang YF, Weng WH, Kuo YM (2016, Oct). Characteristics and determinants of ambient volatile organic compounds in primary schools. *Environmental Science Processes & Impacts*, 18, 1458-1468.
17. Huang LY, **Wang YC**, Wu CC, Chen YC, Huang YL (2016, May). Risk of Flood-Related Diseases of Eyes, Skin and Gastrointestinal Tract in Taiwan: A Retrospective Cohort Study. *PLoS One*, e0155166.

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18. Lin YK, Chen CF, Yeh HC, **Wang YC*** (2016, Mar). Emergency Room Visits Associated with Particulate Concentration and Asian Dust Storms in Metropolitan Taipei. *Journal of Exposure Science and Environmental Epidemiology*, 26(2), 189-196.
19. **Wang YC**, Lin YK (2016, Jul). Mortality and emergency room visits associated with ambient particulate matter constituents in metropolitan Taipei. *Science of the Total Environment*, 569–570, 1427–1434.