

The effects of the pandemic on the economy of Hawaii

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Abstract

Hawaii was vulnerable to the COVID-19 pandemic due to its reliance on tourism. This article analyzes the pandemic's economic impact in Hawaii by comparing outcomes with the pre-pandemic forecast. We explain why Hawaii's experience differed from other states, suggest reasons for a slow recovery, and discuss the pandemic's lasting effects.

1. Introduction

COVID-19 and subsequent public-health countermeasures triggered an unprecedented economic decline. Among US states, Hawaii experienced the highest job losses despite low case rates. We contribute to a growing literature on the economic impact of the pandemic by examining Hawaii's tourism-dependent economy.

The impact on tourism globally is notable. Fotiadis, et. al. (2021) estimated a 30.8% to 76.3% drop in international tourism. Behsudi (2020) and Milesi-Ferretti, (2021) noted that tourism-dependent economies are among the most affected. PlzÁková and Smeral (2021) examined tourism impacts in Europe, and Licchetta et. al. (2022) showed a smaller impact in the US compared to more tourism-dependent European countries. Gounder and Cox (2022) found greater impacts in small-island developing countries specialized in tourism. Qiu et. al. (2020) found that tourism generated significant social costs from perceived risks. Usher (2022) documented the travel experiences of surfers, noting the need to diversify coastal economies. Assaf and Scuderi (2020) offered strategies for tourism recovery, and Fang et. al. (2020) showed how targeted policies boosted recoveries.

Several studies examined specific tourism-based economies. Agovina and Musella (2021) estimated a 79% loss of value added in Sorrento. Lim and To (2022) documented the gambling revenue decline in Macao. Cardenete et. al. (2022) used simulations to estimate a fall in GDP between €16.9m and €17.6m in Andalusia. Kumar and Patel (2022) found that negative tourism shocks explain GDP declines in Fiji, Tonga, and Vanuatu. Small and isolated economies are naturally more specialized (Bond-Smith and McCann, 2020; Bond-Smith, 2021) due to both comparative advantage and increasing returns to scale. But unlike national economies, Hawaii is also as integrated as possible with its largest 'trading partner' as a state of the US. This openness implies even greater specialization. This combination of forces makes Hawaii a fascinating case study of the economic impacts of the pandemic in a tourism-dependent economy.

Focusing on Hawaii, Fuleky (2022) used 18 high-frequency indicators to nowcast economic conditions. Yan et. al. (2022) predicted cases of COVID-19 based on tourist arrivals and air quality. Fuleky and Szapudi (2022) found that Hawaii was more responsive to the virus than other states. The dichotomy between case counts and Hawaii's economy also prompted public health policy reviews: Chyba et al. (2022) and Lee et al. (2022) examined epidemiological models, while Juarez et al. (2022) analyzed vaccine mandates.

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Yet the economic impact in Hawaii remains unclear because [a qualifier is missing here, I suggest “existing”] studies focused on other aspects, and Hawaii’s economic structure is very different from the US overall. The University of Hawaii Economic Research Organization (UHERO) produces quarterly forecasts that provide an opportunity to assess the economic impact of the pandemic by comparing outcomes to the pre-pandemic forecast. Our findings have implications for other tourism-dependent economies.

2 Where we were before Covid

Before the pandemic, the US enjoyed the longest period of growth on record, but growth was tenuous in the Islands. In 2019 tourist arrivals hit a record, but spending per tourist per day declined 4%, payroll jobs declined, and population declined. Real GDP per capita was flat and UHERO forecasted low growth (Bonham et. al., 2019).¹

In many ways, Hawaii had been falling behind for decades. Although tourist numbers kept increasing, seasonally adjusted total real tourism spending peaked in 1989 (Figure 1), and per tourist per day spending peaked in 1992. Tourism spending—highly sensitive to macroeconomic shocks—has been punctured by the ‘90’s recession, 9/11, the Great Recession, and now COVID-19.

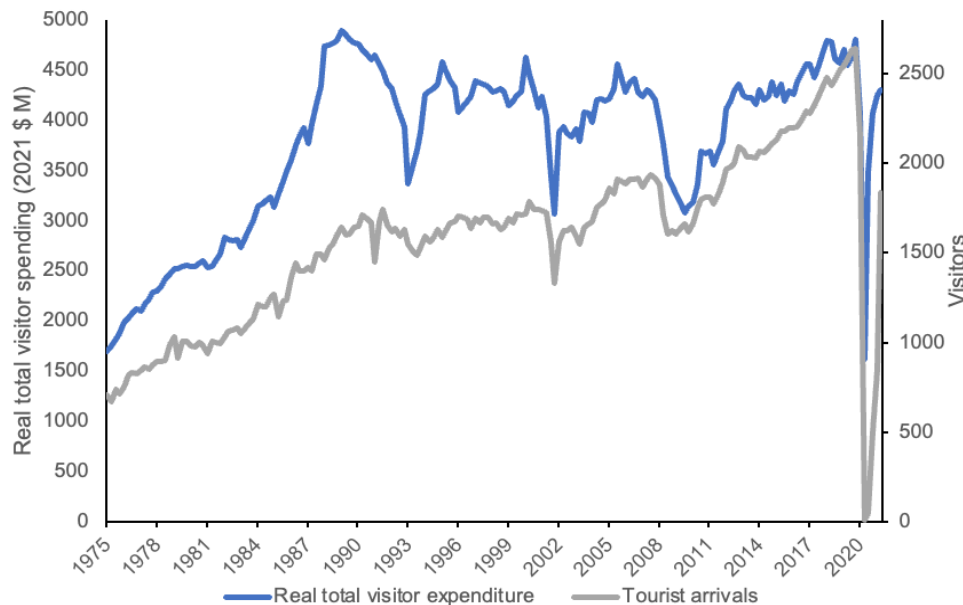


Figure 1: Quarterly Total Real Tourism Spending in 2021 Dollars to Q1 2022, seasonally adjusted; and Tourist arrivals
 Note: Nominal values deflated using the Honolulu CPI

Economic growth reflects a similar pattern. Real GDP per capita in Hawaii peaked in 2005 and declined during the Great Recession. Growth has been soft, with real GDP per capita only reaching this peak again in 2019, while in the US it grew 17% over the same period.

¹ The 2019Q4 forecast refers to the forecast report from UHERO, Bonham et. al. (2019). For the 2019Q4 forecast vintage, GDP history was available through 2019 Q2. The 2019Q4 forecast is scaled by the subsequently (downward) revised data.

3. Economic forecasting in Hawaii

UHERO’s forecast model for Hawaii consists of over 200 equations and macroeconomic identities.² The model has three main components: 1) External drivers, including the projected paths of the US and Japan; 2) Tourism, Hawaii’s main export; 3) Local macroeconomic conditions captured by labor market indicators, incomes, and construction activity.

UHERO’s forecast model required adjustments due to the volatility and uncertainty of the pandemic. Fuleky (2022) developed the weekly UHERO Economic Pulse to monitor local economic activity and measure the extent of recovery in real time. The index accurately predicted job-gains, which are released 3-4 weeks after the reference month. This timely information was essential for anchoring initial conditions of forecasts, and to support decision making.

Figure 3 illustrates the evolution of tourist arrival forecasts over time. The red line shows actual arrivals, and segments in other colors show eleven forecast vintages. The 20Q1 forecast missed the imminent plunge in tourism, but our 20Q2 forecast predicted the magnitude of decline well. Accurate nowcasts helped bring the starting point of each forecast near the ultimate actual values for all subsequent vintages.

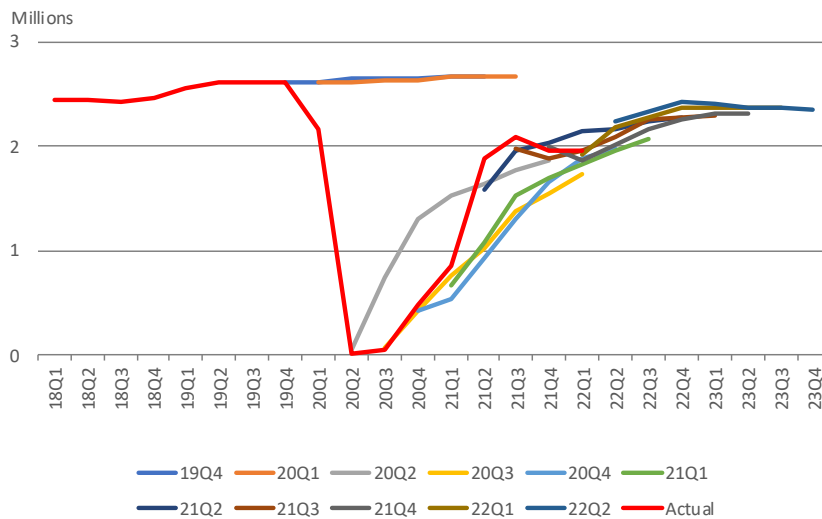


Figure 3: Forecast vintages of quarterly tourist arrivals.

4 Epidemiology and restrictions on activity

Epidemiologically, Hawaii experienced the lowest COVID-19 case rate among US states until the Delta and Omicron waves. While Hawaii saw its highest number of cases during the Omicron wave, hospitalizations did not exceed previous peaks. As of July 16, 2022, Hawaii has recorded 312,981 cases of COVID-19 with approximately half during the Omicron wave, and another quarter during the Omicron BA sub-variants wave.

² Much of the source data is available at the UHERO data portal: <https://data.uhero.hawaii.edu/>.

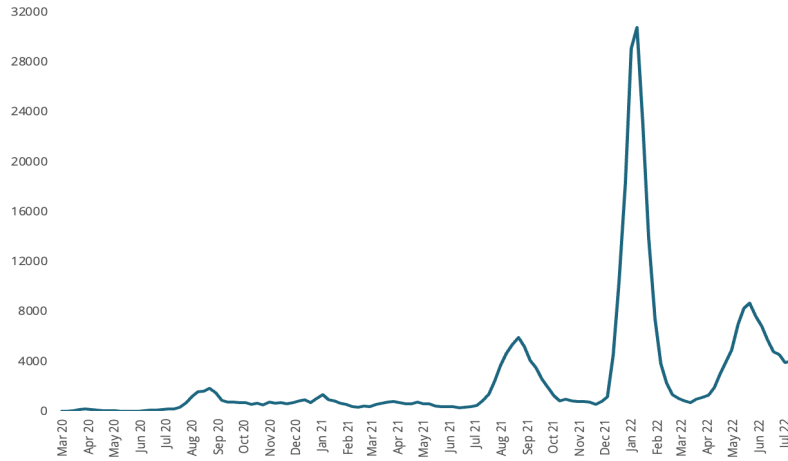


Figure 4: Weekly COVID-19 cases in Hawaii through July 2022.

Hawaii has been proactive in reducing activity to limit the spread of COVID-19. Early in the pandemic, Hawaii implemented a strict stay-at-home order, like much of the United States. But unlike elsewhere in the US, Hawaii required tourists and inter-island travelers to quarantine for 14 days on arrival. These restrictions massively reduced tourist numbers but helped to avoid many cases during the first wave of infections. The Oxford COVID-19 Government Response Tracker (OxCGRT) (Hallas et. al, 2021) indicates that Hawaii maintained stringent restrictions for an extended period.

As restrictions eased over the summer of 2020, Hawaii saw its second COVID-19 wave and its first with more than 200 cases per week. After that wave, arrivals restrictions were eased to allow tourists and inter-island travel without quarantine if travelers tested negative to COVID-19. The number of tourists increased quickly, rising from 20 thousand in September 2020 to 220 thousand in December. Later, Hawaii allowed fully-vaccinated arrivals from the US to avoid quarantine, facilitating even greater arrivals in the summer of 2021.

The high vaccination rate meant that stay-at-home orders were not reimposed during the Delta wave. Despite even higher caseloads (but similar hospitalizations), the Omicron waves also did not trigger restrictions. But each wave generated political debate and news stories, and when hospitalizations ballooned, the Governor discouraged travel. The combination of these factors reduced tourist numbers. While other states saw improving economies despite rising case numbers, Hawaii’s growth stalled with each COVID-19 wave.

5 Economic Impacts

Although Hawaii minimized the initial covid wave by limiting arrivals, it suffered the greatest employment impact among US states. Unemployment surged from 2.2% in March 2020 to 22.4% in April. When restrictions were eased, the number of US tourists surged to a record in the summer of 2021. But international tourists remained absent, delaying Hawaii’s economic recovery. Notably, the UHERO Economic Pulse declined with each wave of COVID-19 as consumers and businesses retrenched. Although the impacts of additional waves appeared to be diminishing, as of early May 2022, the UHERO Economic Pulse had only recovered to 80, well below the pre-pandemic level.

We quantify the impact of the pandemic on Hawaii’s economy by comparing outcomes and current forecasts (Bonham et. al., 2022)³ with UHERO’s pre-pandemic forecast. This approach broadly follows the method in Bonham et. al. (2006) that assessed the economic impact of 9/11 in Hawaii. In 2022Q2 Hawaii’s quarterly annualized gross product plunged to \$77 billion, 17.6% below the pre-pandemic forecast of almost \$94 billion. While the economy partially recovered when restrictions were eased, the output gap persisted. Over the 10-quarter period between early 2020 and mid-2022, *cumulative* lost output is estimated at \$18.7 billion (See Figure 5). However, *nominal* gross product masks a persistent real gap. Once adjusted for inflation, the *annualized* real output gap in 2022Q2 was still 6% of pre-pandemic GDP.

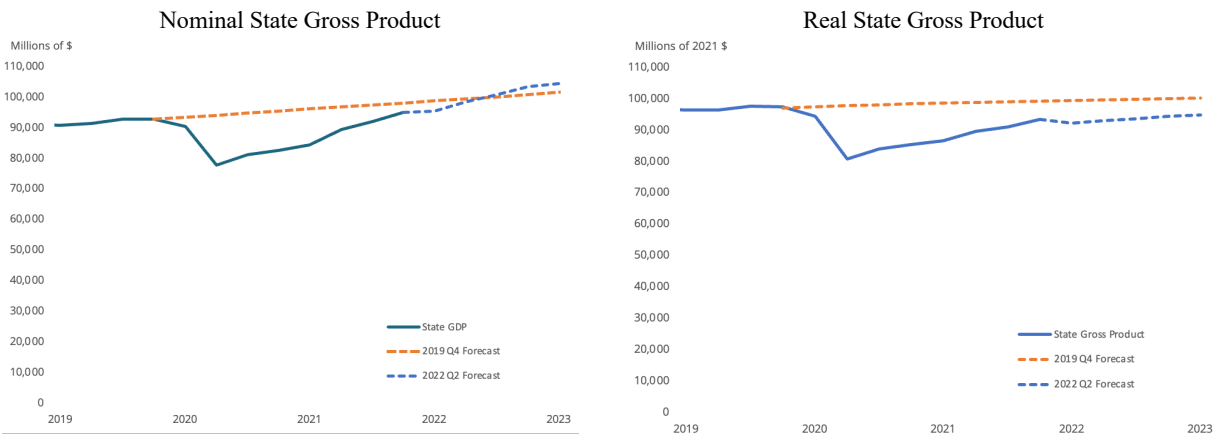


Figure 5: Quarterly nominal and real annualized State Gross Product and 2022Q2 Forecast compared to 2019Q4 Forecast
 Note: The 2019Q4 forecast is scaled by the (downward) revised 2019Q2 historical data. 2019Q4 forecast is deflated by 2019 forecast Honolulu CPI, GDP is deflated using actual Honolulu CPI and 2022Q2 Forecast is deflated using forecast Honolulu CPI.

The sectors most affected were Accommodation and Food Services, Trade, and Transport and Utilities. Annualized earnings in the Accommodation and Food Services sector fell from \$6.5b (in 2021 dollars) to just over \$2.3b in 2020Q2; 64% below the pre-pandemic forecast. Cumulative lost earnings in the sector during the 2020-21 biennium amount to \$6.2 billion (in 2021 dollars)—equivalent to almost a whole year’s earnings. Trade declined almost 12% from annualized earnings of \$5.1 billion to \$4.5 billion (in 2021 dollars) but had fully recovered in the fourth quarter of 2021. Cumulative lost earnings between the beginning of 2020 and the end of 2021 add up to over \$500 million. Annualized earnings in the Transport and Utilities sector declined from \$3.5 billion to under \$2.8 billion (in 2021 dollars) in the second quarter of 2020 and remain 5% below pre-pandemic earnings. Cumulative lost earnings over this period will amount to \$1.1 billion, with an ongoing annual gap of approx. \$150 million.

The loss of jobs led to higher unemployment, a smaller labor force, and a population decline. Quarterly unemployment is projected to fall to its pre-pandemic rate in mid 2023. However, declining unemployment does not imply a full recovery. The labor force participation rate is expected to remain a full percentage point below the pre-pandemic level and outward migration masks the permanent reduction in jobs. Incomes usually match fluctuations in State GDP. However, Federal support bolstered incomes during the pandemic. Much of that support has now

³ For impacts beyond currently available data, we use UHERO’s 2022Q2 forecast.

ended. While the economic recovery has restored much of the lost wage income, real incomes remain below UHERO's 2019Q4 forecast.

6. Concluding Remarks

The approach above of course relies on the accuracy of forecasts. The experience in Hawaii highlights the importance of accurate local forecasts, and nowcasts during periods of volatility. Other tourism dependent economies should consider whether existing economic forecasting is sufficiently local to support timely responses to changing economic conditions. The findings are also limited by the assumption that outcomes diverging from the 2019 forecast were a result of the pandemic. Other events that were unknown in 2019 also influence outcomes, so this approach can only be used in the short term, as we have done.

Our findings highlight Hawaii's exposure to shocks and lagging productivity growth after each shock over decades. The slow recovery of international tourism has limited Hawaii's recovery, but Hawaii is now far more exposed to US demand with lower expenditure per tourist. The need for a more resilient economy is now a priority. Tourism itself was a result of efforts to diversify Hawaii's economy away from plantation agriculture. Tourism has proved more resilient than commodities, and is likely to remain the dominant industry in Hawaii. But resilience can also come from efforts to diversify (Bond-Smith, 2022), not just efforts to develop a more resilient tourism industry (Sharma et. al., 2021).

References

- Agovino, M., and Musella, G. (2021) "Economic losses in tourism during the COVID-19 pandemic. The case of Sorrento", *Current Issues in Tourism*.
- Assaf, A., and Scuderi, R. (2020) "COVID-19 and the recovery of the tourism industry", *Tourism Economics*, Vol. 26, Iss. 5, June, pp 731-733.
- Behsudi, A. (2020) "Wish you were here: Tourism dependent economies are among the most impacted", *IMF Finance and Development*, December.
- Bonham C, Edmonds C, Mak J. (2006) "The Impact of 9/11 and Other Terrible Global Events on Tourism in the United States and Hawaii," *Journal of Travel Research*, Iss. 45, No. 1,99-110.
- Bonham, C. S., Gangnes, B., Fuleky, P., Inafuku, R., Picciotto, I., and Ward, M. (2019) "After a cloudy 2019, new year looks a bit brighter" University of Hawai'i Economic Research Organization (UHERO), UHERO Forecast for the State of Hawaii, December.
- Bonham, C. S., Gangnes, B., Bond-Smith, S., Fuleky, P., Tyndall, J., Inafuku, R., Alford, I., Rahman, A., McLaughlan, J., and Hwang, K. (2022) "Foreign visitors will provide boost, but risks have risen" University of Hawai'i Economic Research Organization (UHERO), UHERO Forecast for the State of Hawaii, May.

- Bond-Smith, S. (2022) “Diversifying Hawai‘i’s specialized economy: A spatial economic perspective”, University of Hawai‘i Economic Research Organization (UHHERO), UHHERO Working Paper, No. 5, August.
- Bond-Smith, S. (2021) “The unintended consequences of increasing returns to scale in geographical economics,” *Journal of Economic Geography*, Vol. 21, Iss. 5, Pages 653-681.
- Bond-Smith, S., and McCann, P. (2020) “A multi-sector model of relatedness, growth and industry clustering,” *Journal of Economic Geography*, Vol. 20, Iss. 5, pp.1145-1163.
- Cardenete, M.A., Delgado, M.C., and Villegas, P. (2022) “Impact assessment of Covid-19 on the tourism sector in Andalusia: an economic approach”, *Current Issues in Tourism*, 25:12, 2029-2035
- Chyba M, Kunwar P, Mileyko Y, Tong A, Lau W, et al. (2022) COVID-19 heterogeneity in islands chain environment. *PLOS ONE* 17(5): e0263866.
- DBEDT (2020) “2019 State of Hawaii Databook”, Hawaii. Dept. of Business, Economic Development and Tourism. Research and Economic Analysis Division. Statistics and Data Support Branch.
- Fang, Y., Zhu, L., Jiang, Y., and Wu, B. (2022) “Estimated effects of economic policies for COVID-19 on the leisure and recreation industry under public health interventions”, *Current Issues in Tourism*, 25:1, 1-13.
- Fotiadis, A., Polyzos, S., Huan, T-C.T.C. (2021) “The good, the bad and the ugly on COVID-19 tourism recovery”, *Annals of Tourism Research*, Vol. 87, March, pp 1-14.
- Fuleky, P. (2022) “Nowcasting the trajectory of the COVID-19 recovery”, *Applied Economics Letters*, 29:11, 1037-1041.
- Fuleky, P. and Szapudi, I. (2022) “Bird’s Eye View of COVID-19, Mobility, and Labor Market Outcomes Across the US”, *Economics of Disasters and Climate Change*, 6, 339–353.
- Gounder, A., and Cox, C. (2022) “Exploring the role of tourism dependency on COVID-19 induced economic shock in the Small Island Developing States”, *Current Issues in Tourism*, 25:7, 1151-1168.
- Hallas, L., Hatibie, A., Koch, R., Majumdar, R., Pyarali, M., Wood, A., Hale, T. (2021) “Variation in US states’ responses to COVID-19”, BSG-WP-2020/034 Version 3.0, Blavatnik School of Government Working Paper Series, University of Oxford.
- Juarez, R., Siegal, N., and Maunakea, A.K. (2022) "The Effects of COVID-19 Vaccine Mandates in Hawaii" *Vaccines* 10, no. 5: 773.

- Kumar, N.N., and Patel, A. (2022) “Modelling the impact of COVID-19 in small pacific island countries”, *Current Issues in Tourism*, 25:3, 394-404.
- Lee, T.H., Do, B., Dantzing, L., Holmes, J., Chyba, M., Hankins, S., Mersereau, E., Hara, K., and Fan, V.Y. (2022) “Mitigation Planning and Policies Informed by COVID-19 Modeling: A Framework and Case Study of the State of Hawaii,” *International Journal of Environmental Research and Public Health*, Iss. 19, no. 10: 6119.
- Lichetta, M., Mattozzi, G., Raciborski, R., and Willis, R. (2022) “Economic adjustment in the Euro area & the United States during the COVID-19 Crisis”, *European Economy Discussion Papers*, European Commission, Directorate-General for Economic and Financial Affairs, March.
- Lim W.M. and To, W.-M. (2022) “The economic impact of a global pandemic on the tourism economy: the case of COVID-19 and Macao’s destination- and gambling-dependent economy”, *Current Issues in Tourism*, 25:8, 1258-1269.
- Milesi-Ferritti, G.M. (2021) “The travel shock”, *Hutchins Center Working Paper #74*, Hutchins Center on Fiscal & Monetary Policy at Brookings, The Brookings Institution, August.
- Qiu, R.T.R., Park, J., Li, S., and Song, H. (2020) “Social costs of tourism during the COVID-19 pandemic”, *Annals of Tourism Research*, Vol 84, September, pp 1-13.
- Plzáková, L., and Smeral, E. (2021) “Impact of the COVID-19 crisis on European tourism”, *Tourism Economics*, Vol. 28, Iss. 1, July, pp91-109.
- Sharma, G.D., Thomas, A., and Paul, J. (2021) “Reviving tourism industry post-COVID-19: A resilience-based framework”, *Tourism Management Perspectives*, Vol. 37 , Article No. 100786.
- Tian, E., Mak, J., and Leung, P. (2011) “The Direct and Indirect Contributions of Tourism to Regional GDP: Hawaii”, Working paper 2011-5, University of Hawaii Economic Research Organization. <https://uhero.hawaii.edu/the-direct-and-indirect-contributions-of-tourism-to-regional-gdp-hawaii/>
- UN World Tourism Organization (2020) “Secretary General’s Policy Brief: COVID-19 and Transforming Tourism”, UNWTO, August.
- Usher, L.E. (2022) “Hosts and guests: Surfers’ experiences of travel and tourism in the first wave of the COVID-19 pandemic”, *Tourism in Marine Environments*.
- Yan, Y., Shah, M.I., Sharma, G.D., Chopra, R., Fareed, Z., and Shahzad, U. (2022) “Can tourism sustain itself through the pandemic: nexus between tourism, COVID-19 cases and air quality spread in the ‘Pineapple State’ Hawaii,” *Current Issues in Tourism*, Vol. 25, Iss. 3, 421-440.