800 West Campbell Road GR31 Richardson, Texas 75080-3021 Phone: 972-883-2017 E-Mail: karl@karlho.com Website: karlho.com

Karl Ho

NARRATIVE

I am a political scientist working at the intersection of data science and political science. My research interests span both domains of data analytics and political studies, with a regional focus on East Asia. The unifying theme of my research is to use data science methods to explain and prescribe social and political problems. Areas of research topics include democratization, political economy, public policy and human rights aiming at building public goods and improving policies, governance and representation.

PROFESSIONAL EXPERIENCE

<u>Director of Graduate Studies (UTD Political Science, August, 2021 – present)</u> <u>Associate Professor of Instruction (August, 2019 - present)</u>

Clinical Associate Professor (2013-2019)

School of Economic, Political and Policy Sciences, University of Texas at Dallas

Associate Program Head (2017-2018)

Social Data Analytics and Research (SDAR)

School of Economic, Political and Policy Sciences, University of Texas at Dallas

Director of Academic Computing (October 2005 - present)

School of Economic, Political and Policy Sciences, University of Texas at Dallas

EDUCATION

1992-96	University of North Texas	Denton, Texas
Ph.D. Political Science		
1990-92	University of North Texas	Denton, Texas
M.S. Political Science 1984-88	Shue Yan College	Hong Kong
Diploma, Journalism	onde Tan Gonege	110118 110118

GRANTS

Research Grants Council of Hong Kong project. "Representation, Fairness, and Participation in Hong Kong's Elections: Assessing Public Perceptions Using a Mixed-Mode Design" (with Stan Wong (PI) at Hong Kong Polytechnic University, King-wah Fu at the University of Hong Kong, and Harold D. Clarke, proposed funding HK\$ 707,341 (~\$ 90,684.74)

Taiwan Ministry of Education, 2018 Taiwan Democracy Symposium fund, awarded \$4,000 Taiwan Studies Program, Illinois State University, 2018 Taiwan Democracy Symposium fund, awarded \$7,000 Taiwan Studies Program, Kennesaw State University, 2018 Taiwan Democracy Symposium fund, awarded \$3,000

Taipei Economic and Cultural Office in Houston, 2018 Taiwan Democracy Symposium fund, awarded \$1,000 Research Grants Council of Hong Kong project. "Social Cleavages, Civic Engagement, and Election Outcomes in Hong Kong: A New Instrument to Measure Public Opinion" (with Stan Wong (PI) at Hong Kong Polytechnic University and Harold D. Clarke, awarded HK\$ 988,996 (~\$126,794.36)

RESEARCH PROJECTS

Co-Principal Investigator, Hong Kong Election Study

- Annual Survey in Hong Kong since 2015

Advisor, **COMETrends**, University of Texas at Dallas

- Annual National Survey since 2020

LEADERSHIP & SPECIAL APPOINTMENTS

Board of Advisors member, Global Risk Mitigation Foundation (2022 – present)

Advisory Board member, Big Data Center, National Chung Hsing University, Taichung, Taiwan (2020 – present)

UTD Center for Asian Studies, Associate Director (2019 - present)

Southern Method University Tower Center Research Associate (2018 – present)

PUBLICATIONS & PRESENTATIONS

Journal articles and book chapters

Wong, Stan Hok-Hui, Karl Ho and Harold Clarke. "Does Loyalty Discourage Exit? Evidence from Post-2020 Hong Kong." *Journal of Asian and African Studies* (2023)

Max Tsungchi Yu and Karl Ho. "COVID and Cognitive Warfare in Taiwan" <u>Journal of Asian and African Studies</u> (2022)

Clarke, Harold D., Marianne C. Stewart and Karl Ho. 2021. "Did Covid-19 Kill Trump Politically? The Pandemic and Voting in the 2020 Presidential Election" *Social Science Quarterly*

Clark, Cal, Karl Ho and Alexander C. Tan (ed.). 2021. *Taiwan: Environmental, Political and Social Issues*. Nova Science Publisher.

Clark, Cal, Alexander C. Tan and Karl Ho (2020) "Was 2016 a Realigning Election in Taiwan?", Asian Survey

Alexander C. Tan, Karl Ho & Cal Clark (2020) "The political economy of Taiwan's regional relations", Asian Affairs: An American Review

Stan Hok-Wui Wong, Kelvin Chun-Man Chan, Karl Ho, and Harold D. Clarke. (2020). "Sources of Electoral Support for Pro-Establishment Parties in the 2016 Legislative Council Election." In Joseph Cheng., *Evaluations of the C. Y. Leung Administration*.

Wong, Stan Hokwui, Karl Ho and Harold D. Clarke (2019) "Mass Production of Individualized Services: Machine Politics in Hong Kong". *Journal of Electoral Studies*.

Ho, Karl, Cal Clark and Alexander C. Tan. (2019) "The New Southbound Policy as a Reorientation of Taiwan's Economic Strategy" in *The Maturation of a Mini-Dragon: Seventy Years of the Republic of China on Taiwan*. Edited by Yao-yuan Yeh and Hans Stockton, Lynne Riener/FirstForum Press

Wong, Stan Hokwui Wong, KC Lee, Karl Ho and Harold D. Clarke (2019) Immigrant Influx and Generational Politics: A Comparative Case Study of Hong Kong and Taiwan. *Electoral Studies*.

Tan, Alex, Cal Clark and Karl Ho. 2018. "Confronting the Costs of its Past Success: Revisiting Taiwan's Postauthoritarian Political and Economic Development." Asian Politics & Policy, 10(3), pp.460-484.

Ho, Karl, Stan Hokwui Wong, Harold D. Clarke and Kuan-chen Lee. 2018. "A Comparative Study of the China Factor in Taiwan and Hong Kong Elections" in Lee, Wei-chin ed. *Taiwan's Political Re-Alignment and Diplomatic Challenges*. Palgrave McMillan.

Tan, Alexander C., Cal Clark and Karl Ho. 2018. "Ending Taiwan's Economic Stagnation: The Implications of the Elections of Presidents Tsai and Trump." *Contemporary Chinese Political Economy and Strategic Relations*. Vol.4, No.3, pp.871-899

Lee, Kuan-chen, Wei-feng Tzeng, Karl Ho and Harold D. Clarke. 2017. "Against Everything Involving China? Two Types of Sinophobia in Taiwan." *Journal of Asian and African Studies*, p.0021909617744375.

Ho, Karl, Cal Clark, and Alexander C. Tan. 2017. "Politicized to Mobilize? A Longitudinal Study of First Time Voter Turnout in Taiwan, 2004-2016". *Journal of Electoral Studies*. 24(2), pp.97-115.

Tan, Alex and Karl Ho. 2017. "Cross-strait relations and the Taiwan Voter" (with Alex Tan) in *The Taiwan Voter* ed. Christopher Achen and T.Y. Wang. The University of Michigan Press.

Ho, Karl, Dennis Lu-Chung Weng, and Harold D. Clarke. 2015. "Using repeated cross-sectional surveys to study political attitudes and behavior in a new democracy: HAPC models for Taiwan." *Electoral Studies* 39: 256-263.

Ho, Karl, Harold D. Clarke, Li-Khan Chen, and Dennis Lu-Chung Weng. 2013 "Valence politics and electoral choice in a new democracy: The case of Taiwan." *Electoral Studies* 32.3: 476-481.

Elliott, Euel W., Karl Ho, and Jennifer S. Holmes. 2009. "Political science computing: A review of trends in computer evolution and political science research." *Journal of Information Technology & Politics* 6.2: 166-175.

Ho, Karl, and Jimmy Naugher. 2000. "Outliers lie: An illustrative example of identifying outliers and applying robust models." *Multiple Linear Regression Viewpoints* 26.2: 2-6.

Tan, Alexander C., Karl Ho, Kyung-Tae Kang, and Tsung-Chi Yu. 2000. "What if we don't party? Political partisanship in Taiwan and Korea in the 1990s." *Journal of Asian and African Studies* 35.1: 67-84.

Clarke, Harold D., Karl Ho, and Marianne C. Stewart. 2000. "Major's lesser (not minor) effects: prime ministerial approval and governing party support in Britain since 1979." *Electoral Studies* 19.2-3: 255-273.

Karl Ho. 1999. "The Hong Kong Legislative Election in 1998" Electoral Studies. Vol. 18, pp. 438-45.

Poe, Steven C., Dierdre Wendel-Blunt, and Karl Ho. 1997. "Global patterns in the achievement of women's human rights to equality." *Human Rights Quarterly* 19.4: 813-835.

Recent Presentations:

"The "Cyber" Factor in Taiwan Elections" presented at the *Building the Peaceful Foundation for the Uncertain Taiwan Strait* Conference, February 3-4, 2023, Sam Houston State University, Houston, Texas

"Isotonic Regression and Machine Learning Models: Illustration with COVID data" (with Chuan-fa Tang) presented at the Texas Methods Conference hosted at the University of Texas at Austin, November 4-5, 2022

"Polarization, Media Exposure and Hyperpartisanship in Taiwan" presented at the Taiwan Institute for Governance and Communication Research International Conference on *Political Polarization: Perspectives of Governance and Communication*, October 28th, 2022.

"Taiwan COVID Resilience: A Global Perspective" presented at the *Trilateral Relationship between Taiwan, the United States, and China: The Past, Present, and Future* Conference, October 22-23, 2022, St. Thomas University, Houston, TX

"Hyperpartisanship in Taiwan Media and Electorate" (with Alex Tan and Cal Clark) presented at *the American Political Science Association Conference Group of Taiwan Studies* annual meeting at Montreal, Canada, September 15th - 17th, 2022

"Are We Measuring Internal Political Efficacy in Autocracies? Comparing Hong Kong and Taiwan" (with Stan Wong) presented at the *American Political Science Association Conference Group of Taiwan Studies* annual meeting at Montreal, Canada, September 15th -17th, 2022

- "Isotonic Regression and Machine Learning Models: Illustration with COVID data" (with Chuan-Fa Tang) presented (virtually) at the *International Society for Data Science and Analytics* Annual Meeting, May 31st June 1st, 2022, Notre Dame University, IN
- "If We Burn, You Burn With Us: Annihilation Motive In Uprisings" (with Stan Hok-wui Wong and Harold D. Clarke) presented at the 2022 Midwest Political Science Association Annual Conference, Chicago, IL
- "Cultural Divide and Polarization: Spatial models on Bestseller book data" (with Euel Elliott) presented at the 2022 Midwest Political Science Association Annual Conference, Chicago, IL
- "Did Covid-19 Kill Trump Politically? The Pandemic and Voting in the 2020 US Presidential Election" (with Harold D. Clarke and Marianne Stewart) presented (virtually) at the "Enlightened State of Mind for Public Governance in the Post-COVID-19 Era What will we do differently to build a more Sustainable Future?" conference, National Chung Hsing University, Taichung, Taiwan ROC December 3rd, 2021.
- "COVID-19 and Cognitive Warfare in the Taiwan Strait Crisis" (with Max Tsung-chi Yu) presented at the APSA Conference Group on Taiwan Studies (CGOTS) Annual Meeting, September 30th to October 3rd, 2021.
- "Political Polarization in Taiwan: Issues and Sentiments in Party Support Models" (with Cal Clark and Alexander C. Tan) presented at the APSA Conference Group on Taiwan Studies (CGOTS) Annual Meeting, September 30th to October 3rd, 2021.
- "Political Polarization and Partisan Dis-alignment in Taiwan" (with Alexander C. Tan and Cal Clark) presented (virtually) at the Taiwan Institute for Governance and Communication Research (TIGCR) conference held in Taipei, Taiwan ROC October 29th, 2021.
- "Revolution as an Ultimatum Game: the Case of Hong Kong's Anti-ELAB Movement" (with Stan Wong and Harold D. Clarke) presented at the 2021 American Association of Chinese Studies (AACS) Annual Conference (Virtual), OCTOBER 15-16, 2021.
- "China's Use of Force in Taiwan: A Policy Analysis" presented at the 2021 Conference of the Taiwan and Asia Program hosted by the Walker Institute, University of South Carolina, Columbia, South Carolina, June 4-6, 2021.
- "Partisan Polarization and Fragmentation in the Taiwanese Electorate: Evidence from the 2020 Elections" presented at the APSA Conference Group on Taiwan Studies Annual Meeting (Virtual), September 10 13, 2020.
- "Social Value Formation in Shared Economy: a case study of Community Refrigerators in Taiwan" (with Ching-Heng Pan), presented at the Social Value International conference 2019 held in HNBK International Convention Center, December 4-5, 2019, Taipei, Taiwan
- "Political economy of Taiwan regional relations" (with Alexander C. Tan and Cal Clark) presented at the "The Taiwan Relations Act at 40: Democracy in a Changing World" conference held at the Western Michigan University, November 9-10, 2019, Kalamazoo, MI
- "Political Polarization in Taiwan and the United States: A Research Puzzle" (with Cal Clark and Alexander C. Tan) presented at the Taiwan Institute for Governance and Communication Research (TIGCR) International Conference on "Political Polarization: Perspectives of Governance and Communications, National Chengchi University, Taipei, Taiwan, October 29, 2019.
- Ho, Karl. 2019. "Polarization and Representation Deficit: a Comparative Study of Taiwan and the United

States" presented at the 2019 Global Forum on Modern Direct Democracy, October 2-5, National Chung Hsing University, Taichung, Taiwan ROC

"Clientelist Politics in Taiwan: Reverse Coattails Effects and Electoral Fortune in Local Elections, 1998-2018" (with KC Chen) presented at the 2019 American Political Science Association Conference Group of Taiwan Studies Annual Conference, Washington, DC.

Ho, Karl. 2019. "New Social Media Sampling Strategy: An Exploratory Study using Non-API methods for Social Data Extraction" to be presented at the 2019 meeting of the International Society for Data Science and Analytics (ISDSA) to be held in Nanjing University of Posts and Telecommunications, Nanjing, China, July 6-8, 2019

"Issues Impacts and Vote choice in Taiwan Elections, 2004-2016" (with Cal Clark and Alexander C. Tan) presented at the 2019 Midwest Political Science Association Annual Meeting, Chicago, April 5-7, 2019

"Trumping the Economy?" (with Harold D. Clarke and Marianne Stewart) poster presented at the 2019 Texas Methodology Conference at the Rice University, March 22 and 23, 2019.

"Non-API Based Data Extraction Methods and Social Media Sampling Strategies: An Exploratory Study using Twitter Data on Domestic and Foreign Policy Issues" presented at the 2019 Asia Political Methodology Annual meeting, Doshisha University, Kyoto, Japan, January 5 and 6, 2019.

"China Factor in New South-bound Policy: A Comparative Study of Malaysia and the Philippines" (with Tim Chen and Kuan-chen Lee) presented at the "Taiwan and the World in Transition: Opportunities and Challenges" Conference held at the Kennesaw State University, November 9-11, 2018

"Tweet War amid Trade War: Limitations of Twitter messages and Retweets for Public Opinion Research" presented at the 2018 International Conference on E-society Research, National Sun Yat-sen University, Kaohsiung, Taiwan, ROC, September 14-15.

"Partisan Networks and Sustainability of Party System: A Network Analysis of Political Parties in Taiwan" (with Lauren Ratliff Santoro, Kuan-chen Lee and Tim Chen) presented at the 2018 American Political Science Association Conference Group of Taiwan Studies (CGOTS) Annual Meeting, Boston, MA, 8/30-9/2.

"Democratic Legitimacy and Political Activism: An Assessment of Student Movements in East Asian Societies" (with Kuan-chen Lee, Judy Chia-yin Wei, Stan Hokwui Wong and Harold D. Clarke) presented at the 2018 Midwest Political Science Association Annual Meeting, Chicago, April 5-8.

"Democratic Deficit in East Asia? A Comparative Study of Critical Citizenship in Taiwan and Hong Kong" (with Stan Wong, Harold D. Clarke and Kuan-chen Lee) presented at American Association of Chinese Studies annual conference held at the University of South Carolina, Columbia, SC, October 20-22, 2017

"Democratic Legitimacy in East Asia: A Comparative Study of Civic Engagement in Taiwan and Hong Kong" (with Stan Wong, Harold D. Clarke and Kuan-chen Lee) presented at "Taiwan in a New Era: Democracy, Cross-Strait Security, and International Relations" conference at the Illinois State University, Normal, IL, October 13-15, 2017

"The Impact of Issues on the 2016 Presidential Election in Taiwan" (With Cal Clark and Alexander C. Tan) presented at the Conference Group of Taiwan Studies (CGOTS), American Political Science Association Annual Meeting, San Francisco, August 31 - September 3, 2017

"What Political Reforms Do Citizens In An Electoral Autocracy Want: Evidence From A Conjoint Analysis" (with Stan Wong and Harold D. Clarke) presented at the International Studies Association Annual Convention in Hong Kong, June 15-17, 2017.

"The New Southbound Policy as a Reorientation of Taiwan's Economic Strategy" (With Cal Clark and Alexander C. Tan) presented at "The Maturation of a Mini-Dragon: Seventy Years of the Republic of China on Taiwan" conference held at the St. Thomas University in Houston, TX, April 21-22, 2017.

"A Comparative Study of the China Factor in Taiwan and Hong Kong Elections" presented at the "Taiwan in the Realm of East Asia" conference held at the Wake Forest University, Winston-Salem, Oct. 21-23, 2016

"Economic Integration and 'Third Force Voters': A Comparative Study of Taiwan and Hong Kong Elections" (with Harold D. Clarke and Stan Hok-wui Wong and Kuan-chen Lee) presented at the Taiwan Election and Democratization Study conferenced held at the National Chengchi University, Taipei, Taiwan ROC, September 30th, 2016.

"Politicized to mobilize? A panel study of first time voter turnout in Taiwan" (with Alexander C. Tan and Cal Clark) presented at the Taiwan Election and Democratization Study conferenced held at the National Chengchi University, Taipei, Taiwan ROC, September 30th, 2016.

"Houses and Herding: Polling Party Support in Britain" (with Harold D. Clarke and Dennis Weng) presented at 3rd Annual Meeting of Asia Political Methodology at Tsinghua University, Beijing, China, January 8-9, 2016.

"Modeling Hidden Dynamics in Big Survey Data: Models of Voter Attitudes in Election Studies" (With Harold D. Clarke) presented at the International Symposium on Grids and Clouds 2016 13-18 March 2016, Academia Sinica, Taipei, Taiwan

"Measuring Sinophobia in Taiwan: Anxiety, Skepticism, and Its Political Impact on 2012 Taiwan Presidential Election" (with Kuan-chen Lee, Harold D. Clarke and Wei-Feng Tzeng, University of North Texas) presented at the Annual Meeting of the Midwest Political Science Association in Chicago, IL, April 7, 2016

"The Hong Kong Election Study: A New Public Opinion Data Project" (with Stan Wong and Harold D. Clarke) presented at the Annual Meeting of the Midwest Political Science Association in Chicago, IL, April 7, 2016.

"Integration, Identities and Democratization: The Case of Hong Kong" (with Harold D. Clarke and Stan Wong) at International Studies Association (ISA) Pacific Annual Meeting, Hong Kong City University, Hong Kong, June 25-27, 2016

"Was 2016 a Realigning Election?" (with Cal Clark and Alex Tan) presented at the Annual Meeting of the American Association for Chinese Studies, Pepperdine University, Los Angeles, October 7-9, 2016.

"Trade Liberalization and Disintegration: A Comparative Study of the China Factor in Taiwan and Hong Kong Elections" (with Stan Wong, Harold D. Clarke and Kuan-chen Lee) presented at the Taiwan in the Realm of East Asia Conference Oct. 21-23, 2016 Wake Forest University, Winston-Salem, NC

"Economic Integration and Elections: A Comparative Study of Taiwan and Hong Kong" (with Stan Wong, Harold D. Clarke and Kuan-chan Lee) presented at the Taiwan Election and Democratization Study conference held at the National Chengchi University, Taipei Taiwan, October 31st -November 1st, 2016.

"Politicized to Mobilize? A Longitudinal Study of First Time Voter Turnout in Taiwan, 2004-2016" (With Cal Clark and Alex Tan) presented at the Taiwan Election and Democratization Study conference held at the National Chengchi University, Taipei Taiwan, October 31st -November 1st, 2016.

INVITED TALKS & PUBLIC WORKSHOPS

- "Data Programming with R", University of Texas at Dallas Computer Science Outreach, September 23rd to October 7th, 2022.
- "Gentle Introduction to Machine Learning", virtual workshop given at the International Society for Data Science and Analytics (ISDSA) Annual Meeting, Notre Dame University, June 2nd, 2022.
- "China's Digital Hegemony: Social Credit System, Digital Currency and Health Code System" at American Bar Association Conference hosted by the Global Risk Mitigation Foundation, April 27, 2022
- "Taiwan and Texas: Research and Exchange programs at UTD", delivered at the "Bringing Taiwan Studies to Texas and Beyond" Conference hosted by the Taiwan & East Asia Studies Program, Center for International Studies, University of St. Thomas, Houston, Texas, May 7, 2022
- "Text Analytics Applications", Statistics Seminar, Department of Mathematical Sciences, School of Natural Sciences & Mathematics, University of Texas at Dallas, October 22, 2021
- "Social Data Computing: Mining and Modeling Social Media Data", Guest of Honour Speech, International Virtual Conference on Innovations and Research in Marine Electrical and Electronics Engineering hosted at Academy of Maritime Education and Training (AMET), Chennai, India, June 17, 2021
- "Text Mining and Analytics Applications" University of Texas at Dallas Computer Science Outreach Tech Talk series, June 14, 2021
- "Relations with China after the Election" "After the Elections" Online panel hosted at the Texas Tech University, November 9th, 2020
- "Artificial Intelligence: Global Opportunities" Vidya Academy of Science and Technology, Kerala, India, October 20, 2020
- "Gentle Introduction to Machine Learning", UT Dallas Computer Science Outreach series, August 1-13, 2020
- "Data Science in Practice" UT Dallas Transfer Research Initiative Workshop, July 27-30, 2020
- "Social Data Collection and Analytics with Illustration of COVID19 data" UT Dallas Computing Science Online conference, March, 24, 2020
- "Social Media Data Collection and Analytics", UT Dallas Computer Science Outreach invited talk, Feb 29, 2020
- "Data Programming" National Chung Hsing University College of Law and Politics special workshop, May 31, 2019
- "The China Factor in 2020 Taiwan Elections" Greater Dallas Taiwanese Chamber of Commerce invited talk, May 16, 2019
- "Belt and Road Initiative: A Brief Introduction" Greater Dallas Taiwanese Chamber of Commerce Business and Education Conference, Jan 17, 2019
- "Data Science for All" National Chung Hsing University invited workshop, Jan 11, 2019

TEACHING EXPERIENCE

University of Texas at Dallas

Social Data Analytics and Research (SDAR) Methods of Data Collection and Production Data Visualization Endowment Political Science, Public Policy and Political Economy Polity and Politics in China (graduate) Political Economy of East Asia (undergraduate) Politics of China (undergraduate and graduate) Advanced Data Programming East Asian Politics (graduate) Southeast Asia Politics (undergraduate)

Advanced Research Methods

Survey Research

Structural Equation and Multilevel Models

University of North Texas

PSCI 2300 Study of Politics (1999-2002)

PADM 5530 Advanced Computer Applications in Public Administration (1997)

University of North Texas Health Science Center

PHPM 5740 Biostatistics: Introduction to Statistical Packages (2000)

RECOGNITION

2022	President's Teaching Excellence Award for Graduate/Professional Instruction, University of
	Texas at Dallas (nominee)
2019	President's Teaching Excellence Award for Graduate/Professional Instruction, University of
	Texas at Dallas (nominee)
2018	Taiwan Fellowship
2014	EPPS Outstanding Teaching Comet Award, University of Texas at Dallas (Mention)
2013	EPPS Outstanding Teaching Comet Award, University of Texas at Dallas (Mention)
2011	EPPS Comet Award, University of Texas at Dallas
1997	Samuel H. Beer Award - Best Dissertation in British Politics Studies, American Political Science
	Association
1996-97	Sam McAlister Best Graduate Student Award, Department of Political Science, University of
	North Texas
1996-97	Finalist, Best Dissertation Award, University of North Texas
1991-92	Outstanding International Graduate Student, University of North Texas
1991-92	International Education Committee Scholarship, University of North Texas

SERVICES

Committee on Education Policy (CEP) member, UTD (2021-2022) Learning Management System Committee vice chair, UTD (2014)

Reviewer:

American Political Science Review

American Journal of Political Science

Asia and the Pacific Policy Studies

Asian Survey

British Journal of Political Science

Comparative Political Studies

Democratization

International Relations of the Asia-Pacific

International Studies Perspectives

International Studies Quarterly

Journal of Asian and African Studies

Journal of Electoral Studies

National Science Foundation

Political Analysis

Political Behavior

Public Opinion Quarterly

Political Research Quarterly

Social Science Quarterly

Last updated: February 2023