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Dr. Zhong is an epidemiologist who specializes in clinical health economics and outcomes research (HEOR), clinical trials, and large-scale epidemiological studies. She has more than 15 years' research experience in disease areas such as hematology, pulmonary diseases, diabetes, cardiovascular diseases, oncology, rare diseases, and immunology. Dr. Zhong's expertise includes comparative efficacy and safety, individualized medicine, predictive modeling, and longitudinal analysis. Her recent work includes leading large-scale prospective cohort studies, evaluating the comparative efficacy of immuno-oncology treatments for regulatory submissions, quantifying direct and indirect resource utilization and costs, and evaluating real-world effectiveness using patient reported outcomes (PROs). Her research has been published in *Nature Immunology*, *Immunity*, *Proceedings of the National Academy of Sciences*, *Circulation*, *Circulation Research*, *Hypertension*, and the *International Journal of Epidemiology*, among other publications. Prior to joining Analysis Group, Dr. Zhong was a research scientist at the Columbia University Mailman School of Public Health, where she developed data-based therapeutic target identification frameworks.

EDUCATION

2016 Sc.D., environmental health, Harvard T.H. Chan School of Public Health
2008 M.S., biochemistry and molecular biology, Chinese Academy of Sciences
2005 B.S., applied molecular biology, Zhejiang University, China

PROFESSIONAL EXPERIENCE

2017–Present Analysis Group, Inc.
 Vice President (2023–Present)
 Manager (2020–2022)
 Associate (2017–2019)

2016–2017 Columbia University Mailman School of Public Health
 Postgraduate Research Scientist

2009–2012 Boston Children's Hospital
 Research Coordinator

SELECTED CONSULTING EXPERIENCE

HEOR

- **National Longitudinal Cohort of Hematological Diseases in China (NICHE)**
Institute of Hematology & Blood Diseases Hospital
Led the cohort design across a range of hematological diseases, including lymphoma, leukemia, and hemophilia.
- **Epidemiological overview of hemophilia A in China**
An analysis of epidemiology, disease severity, and treatment strategies in hemophilia A
Hemophilia Treatment Center Collaboration Network of China
Based on a national hemophilia registry in China, conducted descriptive analyses to understand current epidemiology, disease profile, and treatment landscape of patients with hemophilia A in China.

ARTICLES AND PUBLICATIONS

- **Zhong J.**, Zhang J., Fang H., Liu L., Xie J., Wu E. Advancing the development of real-world data for healthcare research in China: challenges and opportunities. *BMJ Open*, 12(7): e063139 (2022).
- Xie J., Wu E.Q., Wang S., Cheng T., Zhou Z., **Zhong J.**, Liu L. Real-World Data for Healthcare Research in China: Call for Actions. *Value in Health Regional Issues*, 27: 72–81 (2022).
- Song X., **Zhong J.**, Xue F., Chen L., Li H., Yuan D., Xie J., Shi J., Zhang L., Wu E.Q., Yang R. An overview of patients with haemophilia A in China: Epidemiology, disease severity and treatment strategies. *Haemophilia: The Official Journal of the World Federation of Hemophilia*, 27(1): e51–e59 (2021).
- Wang X., Fang H., Shen K., Liu T., Xie J., Liu Y., Wu P., Chen Y., **Zhong J.**, Wu E., Zhou W., Wu B. Cost-effectiveness analysis of double low-dose budesonide and low-dose budesonide plus montelukast among pediatric patients with persistent asthma receiving Step 3 treatment in China. *Journal of Medical Economics*, 23(12): 1630-1639 (2020).
- Zhou Z.Y., Raimundo K., Patel A.M., Han S., Ji Y., Fang H., **Zhong J.**, Betts K.A., Mahajerin A. Model of Short- and Long-Term Outcomes of Emicizumab Prophylaxis Treatment for Persons with Hemophilia A. *Journal of Managed Care & Specialty Pharmacy*, 26(9): 1109-1120 (2020).
- Wang X., Fang H., Shen K., Liu T., Xie J., Liu Y., **Zhong J.**, Wu E., Zhou W., Wu B. The cost-effectiveness of low-dose budesonide as a Step 2 treatment for pediatric asthma in China. *Journal of Comparative Effectiveness Research*, 10.2217/cer-2020-0102. Advance online publication (2020).
- Mu F., Betts K.A., Woolley J.M., Dua A., Wang Y., **Zhong J.**, Wu E.Q. Prevalence and economic burden of hyperkalemia in the United States Medicare population. *Current Medical Research and Opinion*, 36(8): 1333-1341 (2020).
- Song X., Liu W., Xue F., **Zhong J.**, Yang Y., Liu Y., Xie J., Wu E., Zhang L., Shi J., Yang R. Real-world analysis of haemophilia patients in China: A single centre's experience. *Haemophilia: The Official Journal of the World Federation of Hemophilia*, 26(4): 584-590 (2020).
- Wang G., **Zhong J.**, Guttieres D., Man H.-Y. Non-scaling regulation of AMPA receptors in homeostatic synaptic plasticity. *Neuropharmacology*, 158: 107700 (2019).
- Sanchez-Guerra M., Peng C., Trevisi L., Cardenas A., Wilson A., Osorio-Yáñez C., Niedzwiecki M.M., **Zhong J.**, Svensson K., Acevedo M.T., Solano-Gonzalez M., Amarasiriwardena C.J.,

- Estrada-Gutierrez G., Brennan K.J.M., Schnaas L., Just A.C., Laue H.E., Wright R.J., Téllez-Rojo M.M., Wright R.O., Baccarelli A.A. Altered cord blood mitochondrial DNA content and pregnancy lead exposure in the PROGRESS cohort. *Environment International*, 125: 437-444 (2019).
- **Zhong J.**, Baccarelli A.A., Mansur A., Adir M., Nahum R., Hauser R., Bollati V., Racowsky C., Machtinger R. Maternal Phthalate and Personal Care Products Exposure Alters Extracellular Placental miRNA Profile in Twin Pregnancies. *Reproductive Sciences*, 26(2): 289-294 (2019).
 - Rodosthenous R.S., Kloog I., Colicino E., **Zhong J.**, Herrera L.A., Vokonas P., Schwartz J., Baccarelli A.A., Prada D. Extracellular vesicle-enriched microRNAs interact in the association between long-term particulate matter and blood pressure in elderly men. *Environmental Research*, 167: 640-649 (2018).
 - Machtinger R., **Zhong J.**, Mansur A., Adir M., Racowsky C., Hauser R., Brennan K., Karlsson O., Baccarelli A.A. Placental lncRNA expression is associated with prenatal phthalate exposure. *Toxicological Sciences*, 163(1): 116-22 (2018).
 - Wu S., Gennings C., Wright R.J., Wilson A., Burris H.H., Just A.C., Braun J.M., Svensson K., **Zhong J.**, Brennan K.J., Dereix A. Prenatal Stress, Methylation in Inflammation-Related Genes, and Adiposity Measures in Early Childhood: the Programming Research in Obesity, Growth Environment and Social Stress Cohort Study. *Psychosomatic Medicine*, 80(1): 34-41 (2018).
 - Hao F., Guo H., **Zhong J.**, Geng Q., Yang Y., Chen B., Guo C. Effects of prostaglandin E1 (PGE1) on patients undergoing major gastrointestinal surgery. *Annals of Surgery*, 267(4): 759-765 (2018).
 - **Zhong J.**, Speck M., Urch B., Silverman F., Gold D.R., Koutrakis P., Baccarelli A.A. Reply to Luccock et al.: Significance of interpretation and misinterpretation of a small mechanistic study. *Proceedings of the National Academy of Sciences*, 114(20): E3880-E3881 (2017).
 - **Zhong J.**, Trevisi L., Urch B., Lin X., Speck M., Coull B., Liss G., Thompson A., Wu S., Wilson A., Koutrakis P., Silverman F., Gold D., Baccarelli A. B-vitamin Supplementation Mitigates Effects of Fine Particles on Cardiac Autonomic Dysfunction and Inflammation: A Pilot Human Intervention Trial. *Scientific Reports*, 7: 45322 (2017).
 - **Zhong J.**, Karlsson O., Guo Y., Lin X., Zemplyenyi M., Sanchez-Guerra M., Trevisi L., Urch B., Speck M., Liang L., Coull B., Koutrakis P., Silverman F., Gold D., Baccarelli A. B vitamins attenuate the epigenetic effects of ambient fine particles in a pilot human intervention trial. *Proceedings of the National Academy of Sciences*, 114(13): 3503-3508 (2017).
 - Prada D., **Zhong J.**, Colicino E., Zanobetti A., Schwartz J., Dagincourt N., Fang S.C., Kloog I., Zmuda J.M., Holick M., Herrera L.A., Hou L., Dominici F., Bartali B., Baccarelli A.A. Association of air particulate pollution with bone loss over time and bone fracture risk: analysis of data from two independent studies. *The Lancet: Planetary Health*, (8): e337-e347 (2017).
 - Wu S., Hivert M.F., Cardenas A., **Zhong J.**, Rifas-Shiman S.L., Agha G., Colicino E., Just A.C., Amarasiwardena C., Lin X., Litonjua A.A. Exposure to Low Levels of Lead in Utero and Umbilical Cord Blood DNA Methylation in Project Viva: An Epigenome-Wide Association Study. *Environmental Health Perspectives*, 87019, p.1 (2017).
 - Jiménez-Garza, O., Guo L., Byun H.M., Carrieri M., Bartolucci G.B., **Zhong J.**, Baccarelli A.A. Promoter methylation status in genes related with inflammation, nitrosative stress and xenobiotic metabolism in low-level benzene exposure: Searching for biomarkers of oncogenesis. *Food and Chemical Toxicology*, 109(Pt 1): 669-676 (2017).

- Kresovich J.K., Zhang Z., Fang F., Zheng Y., Sanchez-Guerra M., Joyce B.T., **Zhong J.**, Chervona Y., Wang S., Chang D., McCracken J.P. Histone 3 Modifications and Blood Pressure in the Beijing Truck Driver Air Pollution Study. *Biomarkers*, 22(6): 584-593 (2017).
- Peng C., Sanchez-Guerra M., Wilson A., Mehta A.J., **Zhong J.**, Zanobetti A., Brennan K., Dereix A.E., Coull B.A., Vokonas P., Schwartz J. Short-term effects of air temperature and mitochondrial DNA lesions within an older population. *Environment International*, 103: 23-29 (2017).
- Li J., Zhu X., Yu K., Jiang H., Zhang Y., Deng S., Cheng L., Liu X., **Zhong J.**, Zhang X., He M. Genome-Wide Analysis of DNA Methylation and Acute Coronary Syndrome: Novelty and Significance. *Circulation Research*, 120(11): 1754-1767 (2017).
- Zhang Z., Thomas Joyce B., Kresovich J., Zheng Y., **Zhong J.**, Patel R., Zhang W., Liu L., Dou C., McCracken. J. P., Diaz A., Motta V., Sanchez-Guerra M., Bian S., Bertazzi P. A., Schwartz J., Baccarelli A. A., Wang S., Hou L. Blood pressure and expression of microRNAs in blood. *PLOS One*, 12(3): e0173550 (2017).
- Zheng Y., Sanchez-Guerra M., Zhang Z., Thomas Joyce B., **Zhong J.**, Kresovich J., Liu L., Zhang W., Gao T., Chang, D., Osorio-Yanez C., Carmona J., Wang S., McCracken J.P., Zhang X., Chervona Y., Díaz A., Bertazzi P., Koutrakis P., Choong-Min K., Schwartz J., Baccarelli A., Hou L. Traffic-derived particulate matter exposure and histone H3 modification: A repeated measures study. *Environmental Research*, 153: 112-119 (2016).
- Wallwork R., Colicino E., **Zhong J.**, Kloog I., Coull B., Vokonas P., Schwartz J., Baccarelli A. Ambient Fine Particulate Matter, Outdoor Temperature and Risk of Metabolic Syndrome. *American Journal of Epidemiology*, 185(1): 30-39 (2016).
- Peng C., Bind M.A., Colicino E., Kloog I., Byun H.M., Cantone L., Trevisi L., **Zhong J.**, Brennan K., Dereix A.E., Vokonas P.S., Coull B.A., Schwartz J., Baccarelli A. Particulate Air Pollution and Fasting Blood Glucose in Non-Diabetic Individuals: Associations and Epigenetic Mediation in the Normative Aging Study, 2000-2011. *Environmental Health Perspectives*, 124(11): 1715-1721 (2016).
- Prada D., Colicino E., Power M.C., Weisskopf M.G., **Zhong J.**, Hou L., Spiro A., Vokonas P., Brennan K., Herrera L.A., Schwartz J., Baccarelli A. APOE ϵ 4 allele modifies the association of lead exposure with age-related cognitive decline in older individuals. *Environmental Research*, 151: 101-105 (2016).
- **Zhong J.**, Cayir A., Trevisi L., Sanchez-Guerra M., Lin X., Peng C., Bind MA., Prada D., Laue H., Brennan K., Dereix A., Sparrow D., Vokonas P., Schwartz J., Baccarelli A. Traffic-related air pollution, blood pressure, and adaptive response of mitochondrial abundance. *Circulation*, 133(4): 378-87 (2015).
- **Zhong J.**, Agha G., Baccarelli A. The Role of DNA Methylation in cardiovascular risk and disease: methodological aspects, study design, and data analysis for epidemiological studies. *Circulation Research*, 118(1): 119-131 (2015).
- **Zhong J.**, Urech B., Speck M., Coull B., Koutrakis P., Thorne P., Scott J., Liu L., Brook R., Behbod B., Kotlov T., Silverman F., Baccarelli A., Gold D. Endotoxin and β -1, 3-d-glucan in concentrated ambient particles induce rapid increase in blood pressure in controlled human exposures. *Hypertension*, 66(3): 509-516 (2015).
- Sanchez-Guerra M., Zheng Y., Osorio-Yanez C., **Zhong J.**, Chervona Y., Wang S., Chang D., McCracken J., Díaz A., Bertazzi, P., Koutrakis P., Kang C.M., Zhang X., Zhang W., Byun H.M., Schwartz J., Hou L., Baccarelli A. Effects of Particulate Matter Exposure on Blood 5-

hydroxymethylation: Results from the Beijing Truck Driver Air Pollution Study. *Epigenetics*, 10(7): 633-642 (2015).

- **Zhong J.**, Colicino E., Lin X., Mehta A., Kloog I., Zanobetti A., Byun H.M., Bind M.A., Cantone L., Prada D., Tarantini L., Trevisi L., Sparrow D., Vokonas P., Schwartz J., Baccarelli A.A. Cardiac autonomic dysfunction: particulate air pollution effects are modulated by epigenetic immunoregulation of Toll-like receptor 2 and dietary flavonoid intake. *Journal of the American Heart Association*, 4(1): e001423 (2015).
- Prada D., Colicino E., Power M., Cox D., Weisskopf M., Hou L., Spiro A., Vokonas P., **Zhong J.**, Sanchez-Guerra M., Herrera L., Schwartz J., Baccarelli A. Influence of multiple APOE genetic variants on cognitive function in a cohort of older men - results from the Normative Aging Study. *BMC Psychiatry*, 14:223 (2014).
- Guo L., Byun H.M., **Zhong J.**, Motta V., Barupal J., Zheng Y., Dou C., Zhang F., McCracken J.P., Diaz A., Marco S.G., Colicino S., Schwartz J., Wang S., Hou L., Baccarelli A.A. Effects of short-term exposure to inhalable particulate matter on DNA methylation of tandem repeats. *Environmental and Molecular Mutagenesis*, 55(4): 322-335 (2013).
- Liang O.D., Lu J., Nombela-Arrieta C., **Zhong J.**, Zhao L., Pivarnik G., Mondal S., Chai L., Silberstein L.E., Luo H.R. Deficiency of lipid phosphatase SHIP enables long-term reconstitution of hematopoietic inductive bone marrow microenvironment. *Developmental Cell*, 25: 333-349 (2013).
- Sakai J., Li J., Subramanian K.K., Mondal S., Bajrami B., Hattori H., Jia Y., Dickinson B.C., **Zhong J.**, Ye K., Chang C.J., Ho Y.S., Zhou J., Luo H.R. Reactive oxygen species (ROS)-induced actin glutathionylation and its modulation by glutaredoxin 1 are key physiological regulatory mechanisms controlling actin dynamics in neutrophils. *Immunity*, 37: 1037-1049 (2012).
- Prasad A., Jia Y., Chakraborty A., Li Y., Jain S.K., **Zhong J.**, Roy S.G., Loison L., Mondal S., Sakai J., Blanchard C., Snyder S.H., Luo H.R. Inositol hexakisphosphate kinase 1 (InsP6K1) regulates neutrophil function in innate immunity by inhibiting PtdIns(3,4,5)P3 signaling. *Nature Immunology*, 12(8):752-60 (2011).
- Ruenroengklin N., **Zhong J.**, Duan X.W., Yang B., Li J.R., Jiang Y.M. Effects of various temperatures and pH values on the extraction yield of phenolics from Litchi fruit pericarp tissue and the antioxidant activity of the extracted Anthocyanins. *International Journal of Molecular Sciences*, 9(7):1333-41 (2008).
- **Zhong J.**, Duan X.W., Qu H.X., Yang B., Chen Y.L., Ruenroengklin N., Jiang Y.M. Effects of various extraction conditions on phenolic contents and their antioxidant activities of Litchi fruit pericarp. *Acta Horticulture*, 804:327-9 (2007).

PRESENTATIONS AND SPEAKING ENGAGEMENTS

“Unlock Real-World Data with Machine Learning,” The International Society for Pharmacoeconomics and Outcomes Research Europe (November 2022)

“Empowering Real-World Evidence Generation for Rare Conditions: Collaborative Data Initiatives in the US and China,” International Chinese Statistical 2022 Applied Statistics Symposium (June 2022)

“Advances in the Development and Application of Real-World Evidence: Learnings from the US and China,” The International Society for Pharmacoeconomics and Outcomes Research (May 2022)

“Treatment pattern in the real world: Breast cancer research in China,” Fuzhentan Real-World Research Institute (September 2019)

“Real-world evidence in hematological diseases,” Institute of Hematology & Blood Diseases Hospital (June 2019)

“Cardiovascular Health and Air Pollution,” Peking University (March 2016)

“Environmental Epigenetics in the Era of Big Data,” Key Laboratory of Environment and Health, Huazhong University of Science and Technology (March 2016)

“Environment and Human Health: Novel Mechanism and Opportunity for Intervention,” National Center for Cardiovascular Diseases, China and Fuwai Hospital (February 2016)

“Nutrients and Immuno-epigenetics: Curbing the Cardiovascular Effects of Air Pollution,” American Heart Association, Scientific Session (November 2015)

SELECTED HONORS AND AWARDS

2016 F1000Prime Article of Significance, “Traffic-Related Air Pollution, Blood Pressure, and Adaptive Response of Mitochondrial Abundance,” *Circulation*

2015 Pilot Grant, National Institute of Environmental Health Sciences

2012–2014 Harvard Central Grant, Harvard T.H. Chan School of Public Health

PROFESSIONAL ASSOCIATIONS AND MEMBERSHIPS

2018–Present The International Society for Pharmacoeconomics and Outcomes Research

2012–2017 American Heart Association

LANGUAGES

Chinese (native), English (fluent)