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FOR IMMEDIATE RELEASE

WASE Normal Values Study Presented as Late-Breaking Science at European Society of Cardiology Congress in Paris

Durham, NC, September 2, 2019 – Final data from the World Alliance Societies of Echocardiography (WASE) Normal Values Study was presented this morning as a part of the late-breaking science at the European Society of Cardiology (ESC) Congress in Paris, France. The data presented focuses specifically on 2D left ventricular dimensions, volumes, and function. The WASE Normal Values Study, which was launched in 2016, is unique in that it provides normal reference values of echocardiographic parameters in adults across a wide range of age, race, and ethnicity from 15 different countries. In contrast to previous studies, WASE included head-to-head inter-country and inter-race comparisons, in which all technical differences in data acquisition between regions were minimized and standardized by using state-of-the-art equipment and strictly following the 2015 ASE and European Association of Cardiovascular Imaging (EACVI) updated recommendations for chamber quantification. In addition, data analysis and interpretation were conducted uniformly by a core-laboratory at MedStar Health Research Institute and the University of Chicago.

Federico M. Asch, MD, FASE, MedStar Health Research Institute, Washington, DC, and Roberto M. Lang, MD, FASE, University of Chicago, Chicago, IL, served as co-Principal Investigators on this study. Dr. Asch, who presented the data at ESC, said, "The clinical usefulness of echocardiography is based on the detection of abnormalities, which relies on the accurate definition of "normality" across different countries or races. Currently, available echocardiographic 'reference values' that define 'normality' are mostly based on cross-sectional observations of Caucasians from the United States and Europe. The WASE study evaluated individuals from multiple countries and races with the aim of describing normative values that could be applied to the global community world-wide, and to determine differences and similarities among people from different countries and races. The current report focuses specifically on 2D left ventricular dimensions, volumes, and function."

In total, 2008 subjects were enrolled in the study. The average age was 45, where 42.8% were of White race, 41.8% Asian, and 9.7% Black. Results indicated that left ventricular (LV) dimensions and volumes are larger in males, while left ventricular ejection fraction (LVEF) and global longitudinal strain (GLS) are higher in females. Global WASE normal ranges for LV dimensions were similar to those in the ASE/EACVI guidelines, but the upper limits of normal for LV volumes and the lower limits of normal for LVEF were higher in WASE study participants in all countries. Significant inter-country variation was identified for all left ventricular parameters reflecting LV size (dimensions, mass, and volumes) even after indexing to body surface area (BSA), with left ventricular end-diastolic volume and left ventricular global systolic function having the highest variation. The largest volumes were noted in Australia, while the smallest were measured in India for both genders. While there were no differences in LV size between individuals of White and Black race, the LV of Asians and Mixed (mostly Mexicans mix of White and native American) were smaller. However, within each race group, there were significant inter-country variations. This finding suggests that in addition to gender and BSA, specific country should be

considered when evaluating LV volumes. Inter-country variation for LVEF and GLS was smaller, but still statistically significant. In conclusion, this study points out that current guideline-recommended normal ranges for LV volumes and EF should be adjusted. Inter-country variability is significant for LV volumes and therefore nationality should be considered for defining ranges of normality. A manuscript reporting these findings has been accepted for publication in the *Journal of the American Society of Echocardiography* will be published online later this month.

In addition to Drs. Asch and Lang, authors on the research paper include: **Tatsuya Miyoshi, MD, PhD**, and **Sameer Desale, MS**, MedStar Health Research Institute, Washington DC; **Karima Addetia, MD, FASE**, University of Chicago, Chicago IL; **Rodolfo Citro, MD**, University of Salerno, Salerno, Italy; **Masao Daimon, MD, PhD**, Tokyo University, Tokyo, Japan; **Pedro Gutiérrez-Fajardo, MD, PhD, FASE**, Hospital Bernardette, Guadalajara, Jalisco, Mexico; **Ravi R. Kasliwal, MD, DM, FASE**, Medanta Medicity, Gurgaon, Haryana, India; **James N. Kirkpatrick, MD, FASE**, University of Washington, Seattle, Washington; **Mark J. Monaghan, MSc, PhD**, King's College Hospital, London, UK; **Denisa Muraru, MD**, University of Padua, Padua, Italy; **Kofo Ogunyankin, MD, FASE**, First Cardiology Consultants Hospital Ikoyi, Lagos, Nigeria; **Seung Woo Park, MD**, Samsung Medical Center/Sungkyunkwan University School of Medicine, Seoul, South Korea; **Ricardo E. Ronderos, MD, FASE**, Instituto Cardiovascular de Buenos Aires, Buenos Aires, Argentina; **Anita Sadeghpour, MD, FASE**, Rajaie Cardiovascular Medical and Echocardiography Research Center, Tehran, Iran; **Gregory M. Scalia, MD, FASE**, The Prince Charles Hospital, Brisbane, Australia; **Masaaki Takeuchi, MD, PhD, FASE**, University of Occupational and Environmental Health, Kitakyushu, Japan; **Wendy Tsang, MD**, Toronto General Hospital/University of Toronto, Toronto, Canada; **Edwin S. Tucay, MD, FASE**, Philippine Heart Center, Quezon City, Philippines; **Ana Clara Tude Rodrigues, MD**, Hospital Albert Einstein, São Paulo, Brazil; **Amuthan Vivekanandan, MD, DM, FASE**, Jeyalakshmi Heart Center and Vadamalayan Hospital, Madurai, India; **Yun Zhang, MD, PhD, FASE**, Qilu Hospital of Shandong University, Jinan, Shandong, China; and **Alexandra Blitz**, TOMTEC Imaging Systems GmbH, Unterschleissheim, Germany.

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About ASE

ASE is the Society for Cardiovascular Ultrasound Professionals™. Over 17,000 physicians, sonographers, nurses, veterinarians, and scientists are members of ASE making it the largest global organization for cardiovascular ultrasound imaging and as such the leader and advocate, setting practice standards and guidelines for the field. The Society is committed to improving the practice of ultrasound and imaging of the heart and cardiovascular system for better patient outcomes. For more information about ASE, visit ASEcho.org.

About ASE Foundation

The American Society of Echocardiography Foundation (ASE Foundation) is ASE's charitable arm, helping to assure the viability and visibility of cardiovascular ultrasound. The ASE Foundation was created to provide support for initiatives, such as training scholarships and scientific research, not supported by membership dues. For more information on the WASE study visit: ASEFoundation.org/WASE or the ASE Foundation visit: ASEFoundation.org.

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