Cardiovascular disease remains the most common cause of death in women globally. Yet, data have shown that women are largely unaware of the cardiac disease risk they face and many mistakenly believe that it is primarily a male problem. An increasing number of studies have demonstrated sex-based outcome disparities in women with cardiovascular disease, which cannot be explained by age or comorbidities. These sex-based outcome disparities reflect a larger systemic issue within the field of cardiology. Internationally, cardiology as a professional field lacks diversity, which is increasingly difficult to defend, with persistent inequalities noted in the case of female trainees and cardiologists. Sex-based disparity has been observed in clinical care and also in the cardiology research arena. The majority of data on cardiovascular disease and treatment has been based on studies with severe under-representation of female participants. Cardiovascular research has also been conducted primarily by male researchers, who are more likely to attain funding and be published than their female colleagues. In addition, female under-representation in the cardiology profession limits healthcare access for female patients wishing to be treated by a female cardiologist. The workforce in cardiology, particularly interventional cardiology, remains overwhelmingly male.

The article by Lanocha et al. published in the current issue of Kardiologia Polska (Kardiol Pol, Polish Heart Journal) documents sex differences among the interventional cardiology workforce in Poland between the years 2014 and 2017. Using the National Registry of Cardiology Procedures (Ogólnopolski Rejestr Procedur Kardiologii Inwazyjnej [ORPKI]), Lanocha et al. found that only 1% of female cardiologists worked in the specialty of interventional cardiology and that only 4.1% of cardiologists performing interventional procedures were female. They also reported that most institutions did not employ any female operators (53%), while 36% had a single female operator, and only 11% of institutions had more than one. These data are in line with studies from the United States and Australian, which evaluated sex proportions, patient volume, and outcomes among female and male interventional cardiologists.

The important study by Lanocha et al. provided 3 major findings. First, in interventional cardiology, the operator’s sex does not predict outcomes when evaluating for hard clinical endpoints of all-cause death, bleeding, or coronary artery perforation, even where female operators are found to have significantly lower percutaneous coronary intervention (PCI) volumes. The second major finding of that study is less positive and confirms the significant under-representation of women in the interventional cardiology workforce in Poland. Lanocha et al. showed that the number of female interventional cardiologists in Poland are few and far between, with most working at an institution with no other female operators. Of greater concern is the fact that female operators are unlikely to see any greater comradery in the future, as no significant change in the number of female operators in Poland was seen across the years 2014 and 2017.
The third and novel insight provided in the study by Lanocha et al.\(^{10}\) shows that one’s sex not only appears to influence inclusion in the field of interventional cardiology but it also affects the type of work performed. Further breakdown by the procedure type performed by female versus male interventional cardiologists highlights a more sinister observation, which may be indicative of systemic bias. Female operators in Poland performed an inequitable share of diagnostic angiograms at 3.64% and PCIs at only 2.8%. Female operators were more likely than male operators to perform PCI for acute coronary syndromes rather than stable angina. Female operators were more likely to perform PCIs of single vessels as opposed to men who were more likely to perform multivessel and complex PCIs. Female operators were less likely to be high-volume operators as compared with male interventional cardiologists.

This significant difference in practice between female and male operators may reflect referral and activity bias. For example, are female interventional cardiologists more likely to receive referrals for PCI in the acute setting, rather than referrals for stable yet complex cases? Are female operators more comfortable performing PCI in an acute or urgent setting in which the procedure is required to be done urgently and others are unavailable? Is there any fear of a negative outcome, which will be more harshly viewed, so as they are less likely to proceed in general, particularly in more complex cases? Do male interventional cardiologists receive more outpatient referrals or deferred inpatient referrals and/or do they have more scheduled catheterization laboratory time to perform more complex procedures? Having evidence of these differences in practice draws attention back to sex discrepancies in medicine: lack of women in senior positions and positions of leadership results in fewer female mentors, role models, and training opportunities.\(^{1,2}\) Many more female rather than male doctors have experienced sex-based harassment and discrimination,\(^{11,14}\) which might influence their professional confidence.

As recommended by the Ottawa consensus, the medical staff should aim to produce workforce broadly representative of the population they serve; achieving diversity is a crucial way to obtain equal outcomes.\(^{15}\) As such, we should not ignore this evidence of differences in practice between operators, based on sex, yet perceive it as an opportunity to understand, investigate, and change.