

## EDITORIAL COMMENT

# TAVR in Nonagenarians

## What the World May Learn From Japan\*



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**T**rascatheter aortic valve replacement (TAVR) has revolutionized the treatment of patients with symptomatic severe aortic stenosis (AS) over the last 2 decades.<sup>1</sup> Initially used in elderly and frail patients at prohibitive or high surgical risk, TAVR has now proven equipose or, at times, even superiority in comparison to the former gold standard treatment, surgical aortic valve replacement, across the whole spectrum of surgical risk.<sup>2-9</sup> Given its minimally invasive nature, the current focus of TAVR research is shifting toward patients with asymptomatic severe AS (EARLY TAVR [Evaluation of TAVR Compared to Surveillance for Patients With Asymptomatic Severe Aortic Stenosis], [NCT03042104](#)), symptomatic moderate AS (PROGRESS [Management of Moderate Aortic Stenosis by Clinical Surveillance or TAVR] trial, [NCT04889872](#); EXPAND TAVR II [Transcatheter Aortic Valve Replacement to UNload the Left Ventricle in Patients With ADvanced Heart Failure] trial, [NCT05149755](#)), and symptomatic moderate AS in the setting of heart failure (TAVR UNLOAD trial, [NCT02661451](#)). As the focus of research is moving to the detection of such new treatment target groups, the obligation to deliver the best care possible and to further improve outcomes in these patient subgroups, which would

nowadays be considered standard recipients of TAVR, remains in equal measure.

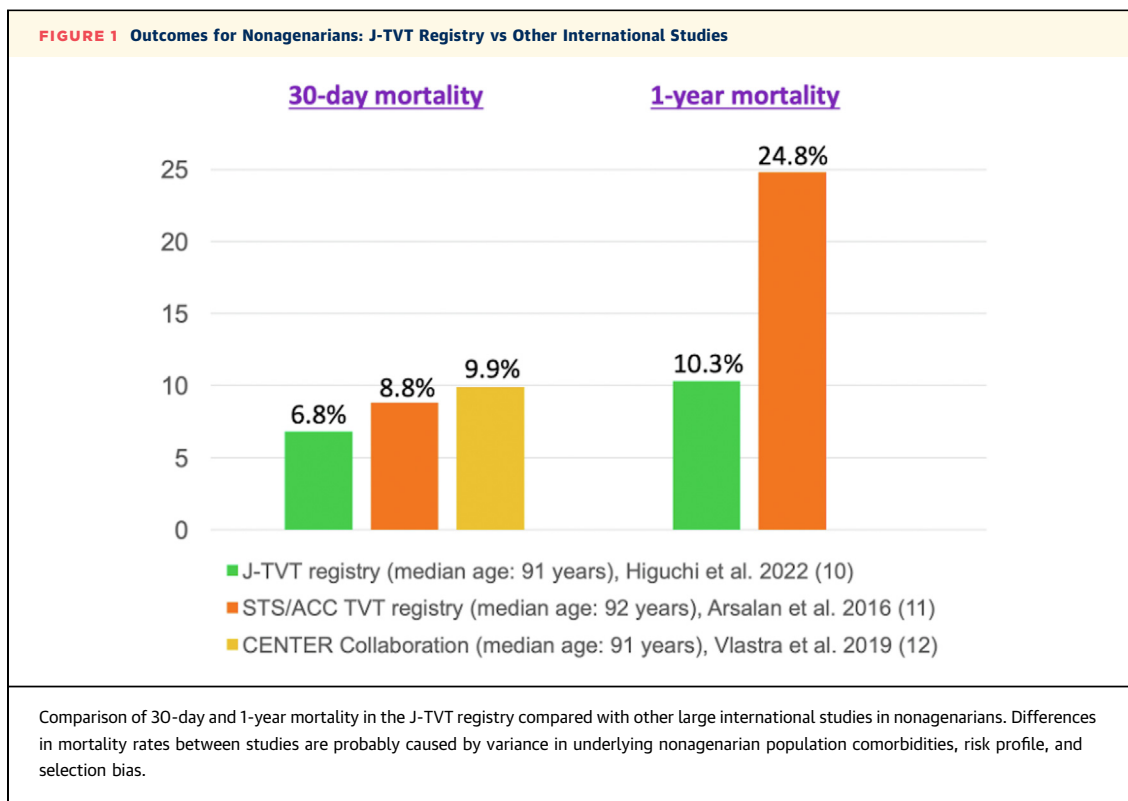
Against this background, the data by Higuchi et al<sup>10</sup> presented in this issue of *JACC: Asia* regarding outcomes of nonagenarians undergoing TAVR based on the nationwide J-TVT (Japan Transcatheter Valve Therapies) registry are highly valuable. Former larger studies on TAVR in nonagenarians, using data from the Society of Thoracic Surgeons/American College of Cardiology TVT (Transcatheter Valve Therapy) registry or the international CENTER (Cerebrovascular Events in Patients Undergoing Transcatheter Aortic Valve Implantation) collaboration, mainly reported on American and European patients and experiences.<sup>11,12</sup> Japan, however, represents the ideal country for further investigation of this subgroup, because according to current demographics with almost one-third of the population aged 65 years or older, more than in most other Western societies.<sup>13</sup> Furthermore, in Japan it is mandatory to report all cases and outcome data to the J-TVT registry to receive and retain institutional certification; hence, the J-TVT registry represents real-world data, free from any potential enrollment bias favoring only expert centers.

Higuchi et al<sup>10</sup> compared characteristics and outcomes of 2,215 nonagenarians (median age 91 years) with 12,813 non-nonagenarians (median age 84 years), who underwent transfemoral TAVR between August 2013 and December 2018. In line with previous studies, nonagenarians less frequently presented with comorbidities, such as diabetes mellitus, malignancies, or coronary artery disease, likely reflecting a survival bias (healthier patients are more likely to be alive at 90 years or beyond) as well as a selection bias (healthier patients are more likely to be considered suitable for TAVR). The notably higher Society of Thoracic Surgeons score, thus, mostly stems from increased age as the main “comorbidity” in these nonagenarian patients. Procedural characteristics and complications did not differ between nonagenarians

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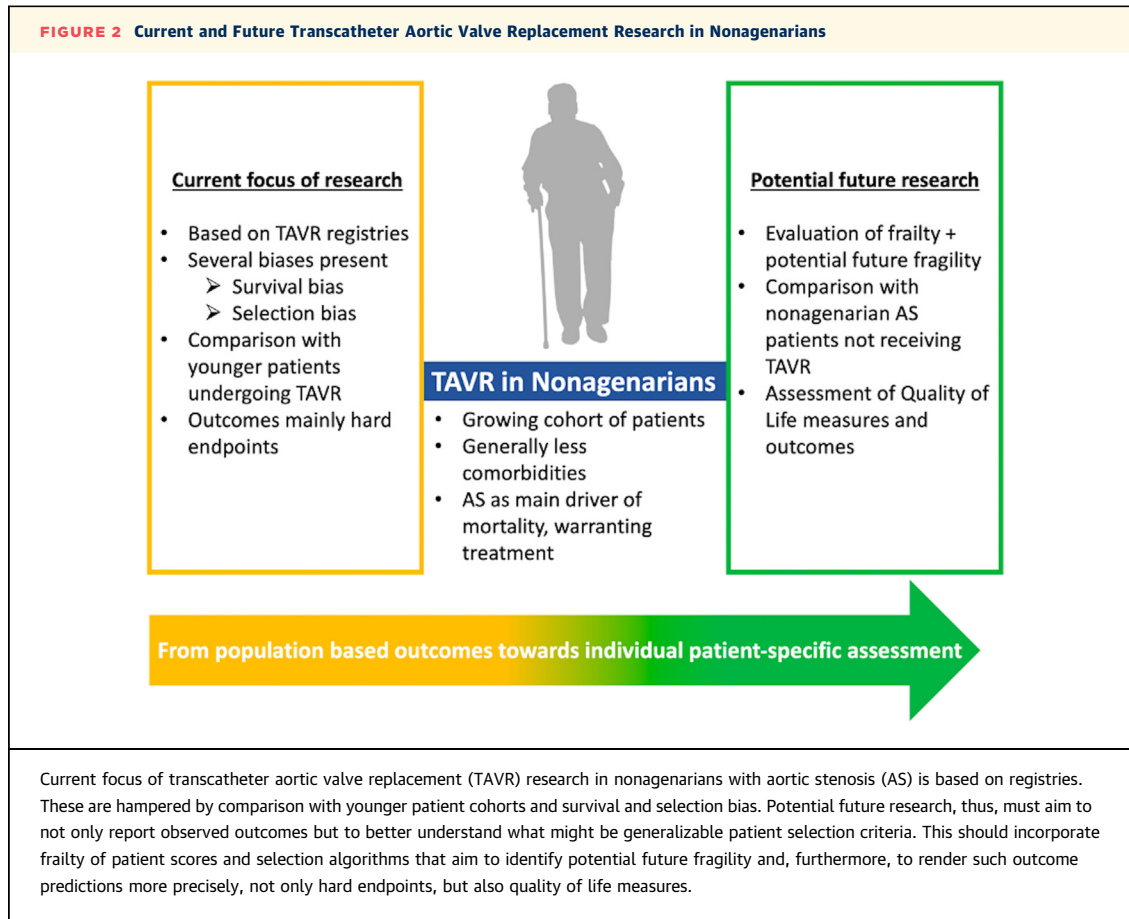
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and younger patients, resulting in comparable 30-day mortality below 2.0% for both groups. After 180 and 360 days, mortality was significantly higher in nonagenarians (6.8% vs 3.8% and 10.3% vs 6.8%, respectively). However, given a probability of 14% for women and 18% for men to die within 12 months when aged 91 years in an industrialized country, these numbers are encouraging and markedly are below what has been previously reported (Figure 1).<sup>11,12,14</sup> The authors report a trend toward better outcomes in more recent procedures, albeit they do not elucidate whether this effect would differ between nonagenarians vs younger patients; furthermore, the presented data shows a lower mortality not only in more recent procedures, but also in those performed in 2013 when compared with 2015, which has been set as reference year for this analysis. Nonetheless, as the last patients of the reported cohort were treated in 2018, it is very reasonable to expect comparable or possibly even better outcomes in current practice. TAVR in this cohort was only performed via transfemoral access, which, in fact, might have been one reason for the lower rate of 30-day mortality compared with other reports on nonagenarians.<sup>11</sup> The transfemoral route, thus, represents

the preferred, if not even the only justifiable, access in this subgroup of patients. Last, when interpreting the data by Higuchi et al,<sup>10</sup> it is important to note that VARC-2-defined vascular complications, previously found to be elevated in nonagenarians, are not reported in the J-TVT registry, and, thus, could attenuate the presented results.

Taken together, the outcomes in nonagenarians seen in the J-TVT registry are encouraging and very welcome data as Japan is uniquely positioned caused by its population demographics to be the ideal leader when it comes to optimizing care for this growing group of patients. Nevertheless, it is important to bear in mind that such analyses of nonagenarians comparing outcomes with younger patients, and not to nonagenarians experiencing similar symptoms but not undergoing TAVR, will always be prone to a selection bias. A goal of further research, thus, must be to not only report observed outcomes but to better understand what might be generalizable patient selection criteria. Here, not only should current frailty of patients be assessed, but selection algorithms should also aim to identify potential future fragility in this vulnerable cohort. Furthermore, to render such outcome predictions more precisely, not only hard



endpoints, but also quality of life measures, which were not assessed in the J-TVT registry, should be incorporated (Figure 2).

Even 20 years after the TAVR journey started, there still seems to be a lot more to understand and learn to optimize outcomes across all different groups of patients. The additional data by Higuchi et al<sup>10</sup> mark important further steps of this ongoing journey in the subgroup of nonagenarian patients.

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