

**Table S1 | Impact of MR grade and Aortic valve area on mortality**

|   | HR    | 95% CI      | P      |
|---|-------|-------------|--------|
| Up to mild MR +<br>AVA $\leq$ 1.35cm <sup>2</sup> versus AVA > 1.35cm <sup>2</sup>                        |       |             |        |
| Univariate  | 1.223 | 1.094-1.368 | <0.001 |
| Adjusted for all clinical*  | 1.15  | 1.027-1.288 | 0.015  |
| Adjusted for all echocardiographic†   | 1.168 | 1.032-1.321 | 0.014  |
| Adjusted for both *†  | 1.116 | 0.984-1.266 | 0.087  |
| Adjusted for Diastolic parameter # + Cardiac output   | 0.985 | 0.815-1.191 | 0.878  |
|   |       |             |        |
| Greater than mild MR +<br>AVA $\leq$ 1.35cm <sup>2</sup> versus AVA > 1.35cm <sup>2</sup>                 |       |             |        |
| Univariate  | 1.426 | 1.142-1.78  | 0.002  |
| Adjusted for all clinical*  | 1.324 | 1.053-1.664 | 0.016  |
| Adjusted for all echocardiographic†   | 1.242 | 0.969       | 1.592  |
| Adjusted for both *†  | 1.23  | 0.954-1.586 | 0.11   |
| Adjusted for Diastolic parameter # + Cardiac output   | 1.176 | 0.818-1.689 | 0.382  |
|   |       |             |        |
| AVA > 1.35cm <sup>2</sup> +<br>MR up to mild versus greater than mild                                     |       |             |        |
| Univariate analysis   | 1.431 | 1.181-1.735 | <0.001 |
| Adjusted for all clinical*  | 1.22  | 1.003-1.484 | 0.046  |
| Adjusted for all echocardiographic†   | 1.317 | 1.057-1.639 | 0.014  |
| Adjusted for both *†  | 1.191 | 0.95-1.493  | 0.129  |
| Adjusted for Diastolic parameter # + Cardiac output   | 1     | 0.74-1.353  | 0.998  |
|   |       |             |        |
| AVA $\leq$ 1.35cm <sup>2</sup> +<br>MR up to mild versus greater than mild                                |       |             |        |
| Univariate analysis   | 1.684 | 1.438-1.972 | <0.001 |
| Adjusted for all clinical*  | 1.388 | 1.18-1.632  | <0.001 |
| Adjusted for all echocardiographic†   | 1.409 | 1.167-1.701 | <0.001 |
| Adjusted for both *†  | 1.196 | 0.99-1.444  | 0.064  |
| Adjusted for Diastolic parameter # + Cardiac output   | 1.055 | 0.798-1.395 | 0.706  |
|   |       |             |        |
| Greater than mild MR + AVA $\leq$ 1.35cm <sup>2</sup> versus<br>Up to mild MR + AVA > 1.35cm <sup>2</sup> |       |             |        |
| Univariate analysis   | 2.049 | 1.753-2.396 | <0.001 |

|   |       |             |        |
|---|-------|-------------|--------|
| Adjusted for all clinical*                          | 1.543 | 1.312-1.815 | <0.001 |
| Adjusted for all echocardiographic†                 | 1.737 | 1.446-2.086 | <0.001 |
| Adjusted for both *†                                | 1.377 | 1.144-1.657 | <0.001 |
| Adjusted for Diastolic parameter # + Cardiac output | 1.127 | 0.84-1.513  | 0.425  |

\* For clinical variables – Age, Sex, Atrial fibrillation, chronic renal failure Hypertension, Ischemic heart disease, COPD

† For Echocardiographic variables – Ejection fraction, Left ventricle end diastolic diameter, Left ventricle end systolic diameter, Aortic valve regurgitation grade, right ventricle size, right ventricle function

# For Diastolic parameter – LAVI, DT, Average E/e', E/A ratio, sPAP

**Table S2** | Patients' clinical and echocardiographic measurements according to Intervention (Surgical AVR) in patient with MR>mild and AVA $\leq$ 1.35cm<sup>2</sup>

|  | MR > mild + AVA $\leq$ 1.35cm <sup>2</sup> |                     |        |
|--|--|---------------------|--------|
|  | No intervention (n=295)                    | SAVR (n=10)         | P      |
| Age (years) <sup>a</sup>                 | 84.42 (77.51-89.21)                        | 65.77 (63.3-68.93)  | <0.001 |
| Sex (Female)                             | 165 (55.9)                                 | 5 (50)              | 0.71   |
| Deceased during Follow-up                | 211 (71.5)                                 | 4 (40)              | 0.032  |
| Heart Failure admission                  | 83 (28.1)                                  | 1 (10)              | 0.207  |
| AF                                       | 108 (36.6)                                 | 5 (50)              | 0.389  |
| CRF                                      | 59 (20)                                    | 2 (20)              | 1      |
| Malignancy                               | 69 (23.4)                                  | 0                   | 0.082  |
| HTN                                      | 216 (73.2)                                 | 7 (70)              | 0.821  |
| DM                                       | 94 (31.9)                                  | 5 (50)              | 0.228  |
| CVA/TIA                                  | 48 (16.3)                                  | 0                   | 0.165  |
| IHD                                      | 131 (44.4)                                 | 6 (60)              | 0.33   |
| COPD                                     | 31 (10.5)                                  | 0                   | 0.279  |
| LV EF <sup>a</sup>                       | 55 (45-60)                                 | 60 (45-60)          | 0.485  |
| Cardiac output (liter/min) <sup>a</sup>  | 4.77 (4.03-5.7)                            | 5.42 (4.45-7)       | 0.174  |
| LVEDd (mm) <sup>a</sup>                  | 48 (44-54)                                 | 51 (49-57)          | 0.097  |
| LVESd (mm) <sup>a</sup>                  | 31 (26-38)                                 | 31 (28-37)          | 0.888  |
| Aortic valve area (cm2) <sup>a</sup>     | 1.13 (1.08-1.26)                           | 1.15 (1.1-1.2)      | 0.775  |
| Peak aortic gradient (mmHg) <sup>a</sup> | 29 (22-38)                                 | 39 (37-45)          | 0.01   |
| Mean aortic gradient (mmHg) <sup>a</sup> | 17 (13-21)                                 | 23 (18-28)          | 0.009  |
| LAVI (ml/m2) <sup>a</sup>                | 52.1 (44.2-65)                             | 47.5 (46.8-48.4)    | 0.442  |
| Deceleration time (ms) <sup>a</sup>      | 180 (148-229)                              | 197 (173-235)       | 0.327  |
| E/e' <sup>a</sup>                        | 17.58 (14.03-22.64)                        | 19.37 (17.92-23.93) | 0.092  |

|                          |                  |               |             |       |
|--------------------------|------------------|---------------|-------------|-------|
| E/A ratio <sup>a</sup>   |                  | 1.2 (0.9-1.7) | 1.2 (1-2.9) | 0.6   |
| sPAP (mmHg) <sup>a</sup> |                  | 49 (39-59)    | 40 (38-50)  | 0.107 |
| AR                       | None             | 115 (39)      | 3 (30)      | 0.762 |
|                          | minimal          | 69 (23.4)     | 2 (20)      |       |
|                          | mild             | 81 (27.5)     | 3 (30)      |       |
|                          | mild to moderate | 30 (10.2)     | 2 (20)      |       |
| RV function              | Normal           | 231 (78.3)    | 10 (100)    | 0.433 |
|                          | Mild             | 45 (15.3)     | 0           |       |
|                          | Moderate         | 16 (5.4)      | 0           |       |
|                          | Severe           | 3 (1)         | 0           |       |
| RV size                  | Normal           | 218 (73.9)    | 10 (100)    | 0.322 |
|                          | Mild             | 59 (20)       | 0           |       |
|                          | Moderate         | 13 (4.4)      | 0           |       |
|                          | Severe           | 5 (1.7)       | 0           |       |

<sup>a</sup>Median and interquartile range. All other values represent the number of patients and percentages

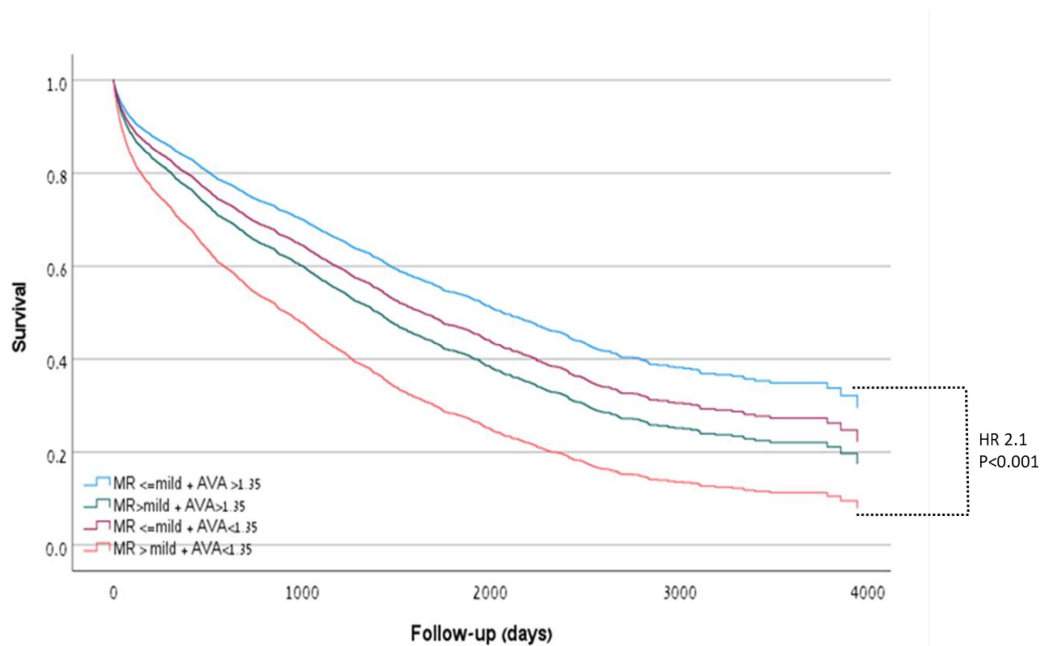
AF – Atrial fibrillation; CRF – Chronic renal failure; DM – Diabetes mellitus; CVA – Cerebrovascular accident; TIA – transient ischemic attack; IHD – Ischemic heart disease; COPD – Chronic obstructive pulmonary disease; LVEDd – Left ventricle end diastolic diameter; LVESd – Left ventricle end systolic diameter; LAVI – Left atrial volume index; sPAP – Systolic pulmonary artery pressure; MR - Mitral Regurgitation; RV – Right Ventricle; AR – Aortic regurgitation; LV EF – Left ventricle ejection fraction

**Table S3 | Impact of Intervention (Surgical AVR) in patient with MR>mild and AVA≤1.35cm<sup>2</sup>**

| HF hospitalization  | HR    | 95% CI      | P     |
|---------------------|-------|-------------|-------|
| Univariate          | 0.21  | 0.029-1.513 | 0.121 |
| Adjusted *          | 0.372 | 0.048-2.895 | 0.345 |
|                     |       |             |       |
| All-Cause Mortality |       |             |       |
| Univariate          | 0.286 | 0.106-0.774 | 0.014 |
| Adjusted *          | 0.508 | 0.177-1.461 | 0.209 |

\* For Age, Left ventricle end diastolic diameter, Aortic valve Peak and mean gradient, Average E/e' ratio

**Figure S1**



**Figure S2**

