

A risk quantification score for heart transplants: A heart donor risk index (HDRI)

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Disclosures

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Background

- Donor factors associated with posttransplant survival
- Eurotransplant Heart Donor Score (HDS):
 - 12-variable heart donor score to predict organ acceptance
 - Donor age, left ventricular function, HDS associated with 3-year survival
 - (Smits et al., JHLT, 2012)
- LV dysfunction can be reversible sequela of brain death
- Weiss et al., OPTN Donor Risk Score (JHLT, 2012)
 - Ischemia time, donor age, race mismatch, and BUN/Cr ≥ 30
 - Score associated with 1- and 5-year recipient mortality posttransplant
- RADIAL score assesses risk of primary graft failure
- Donor diabetes associated with recipient mortality posttransplant (Khush, Circ Heart Fail, 2013)

Methods

- National data: July 1, 2011-December 31, 2013.
- 4887 heart transplants analyzed.
- Cox regression was used to model the risk of allograft survival, based on donor and transplant factors, adjusting for recipient factors.
- To create the HDRI, all non-donor beta coefficients were set to 0 and the beta coefficients were calculated using only donor variables. These beta coefficients represent the values of HDRI.

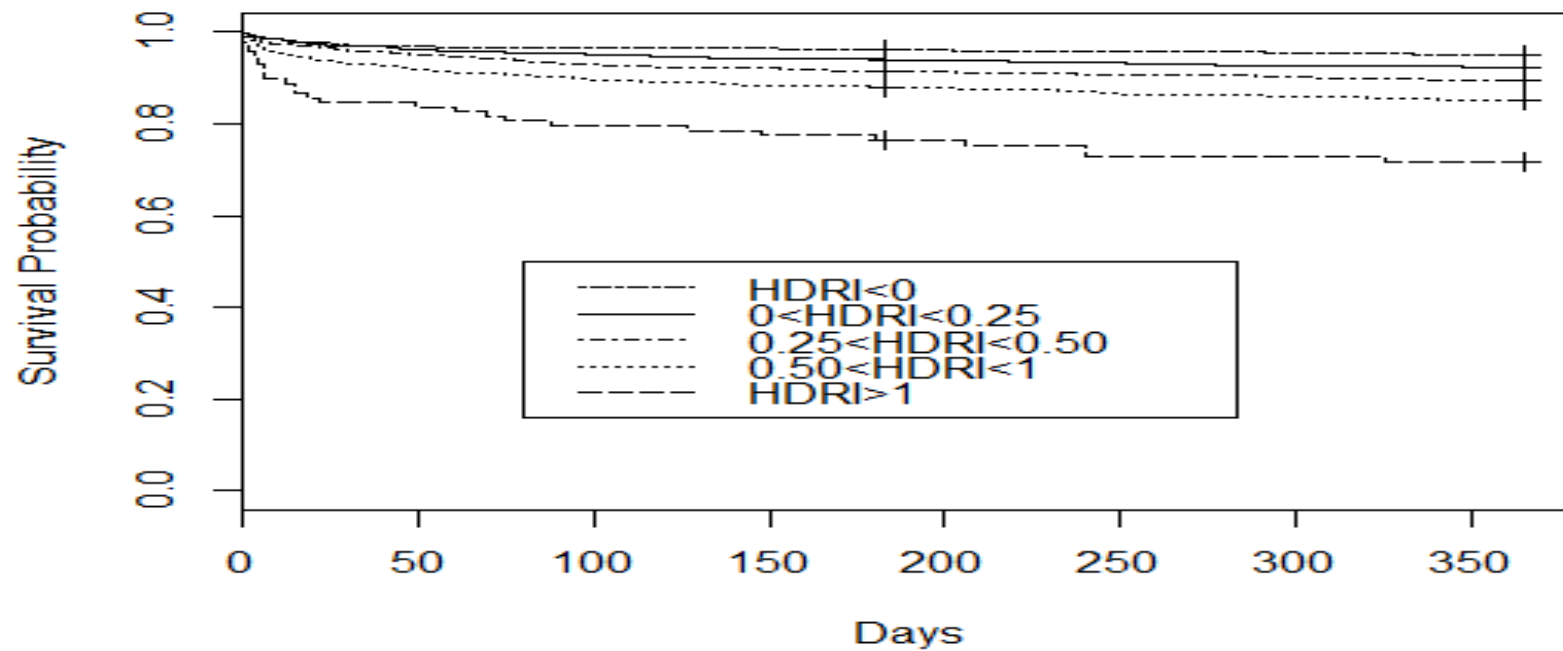
Results

The HDRI includes the following donor factors associated with graft failure:

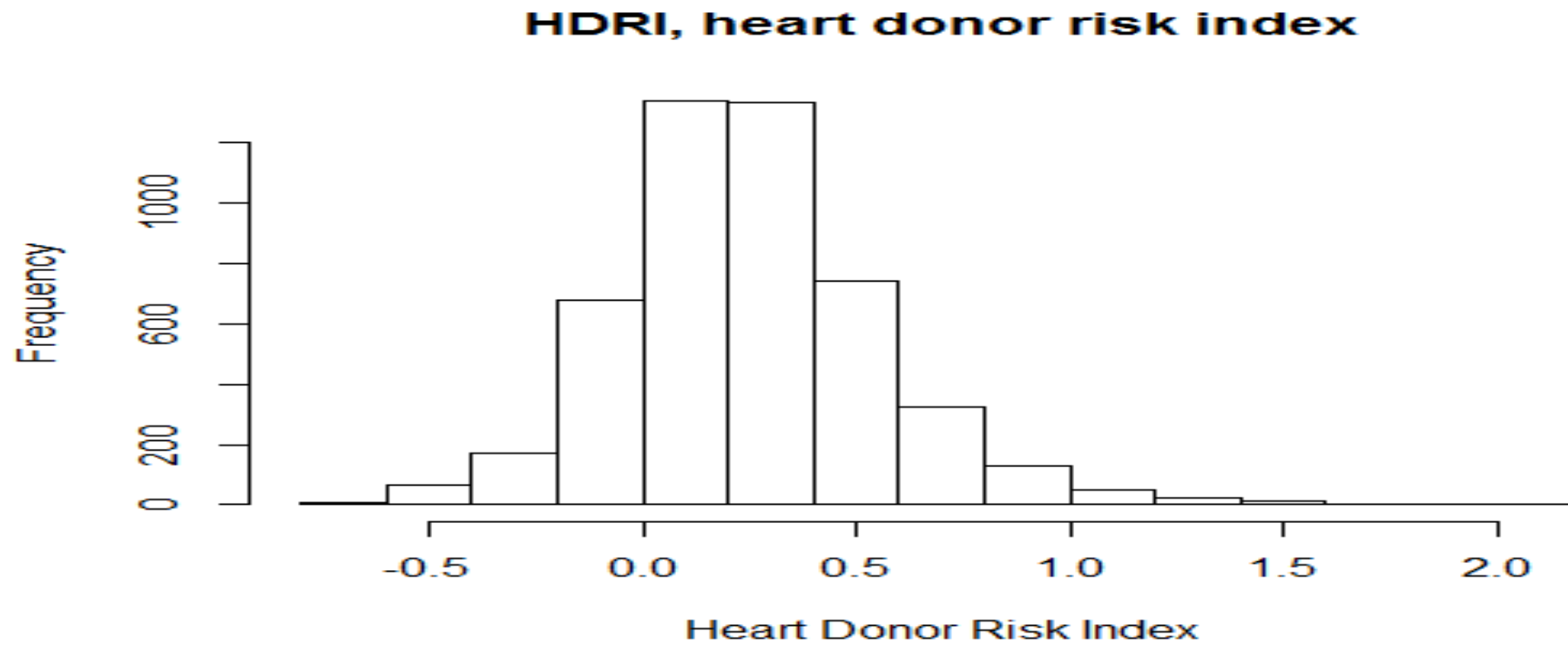
- Age
- Antihypertensives
- ABO blood group
- BMI
- BUN
- Clinical blood infection
- Clinical infection (urine and other source)
- Cause of death
- Cigarette use
- Anti-CMV
- Cocaine use
- DDAVP
- Donor EBV
- Diuretics
- eGFR (mL/min/1.72m², calculated from SCr, age, sex, race)
- Ethnicity
- HBsAb, HBcAb
- Hematocrit
- Heparin
- High risk for blood-borne disease transmission
- History of cancer
- History of diabetes
- Insulin dependence
- INR
- Intracranial cancer at the time of procurement
- Vasodilators
- Number of transfusions during this (terminal) hospitalization
- Other drug use (non-IV)
- Proteinuria
- Race
- Sex
- Steroids

Results, cont.

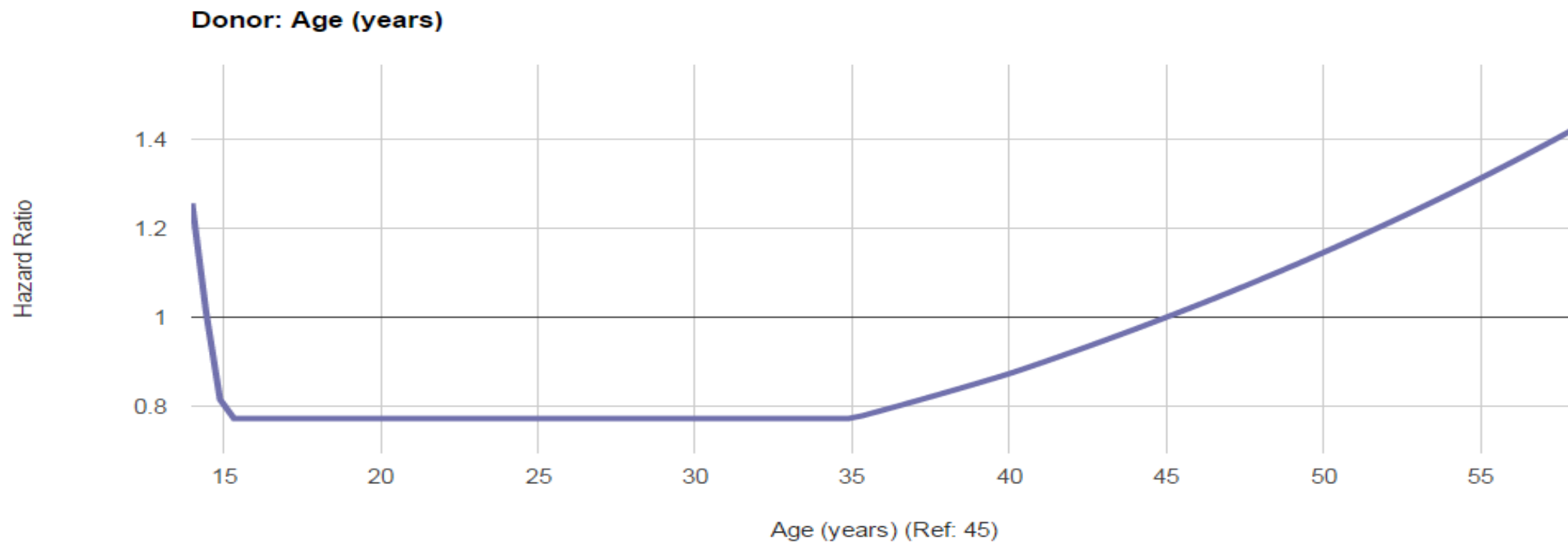
- Mean HDRI = 0.38 (graft failure), 0.23 (no graft failure); $p < 0.001$



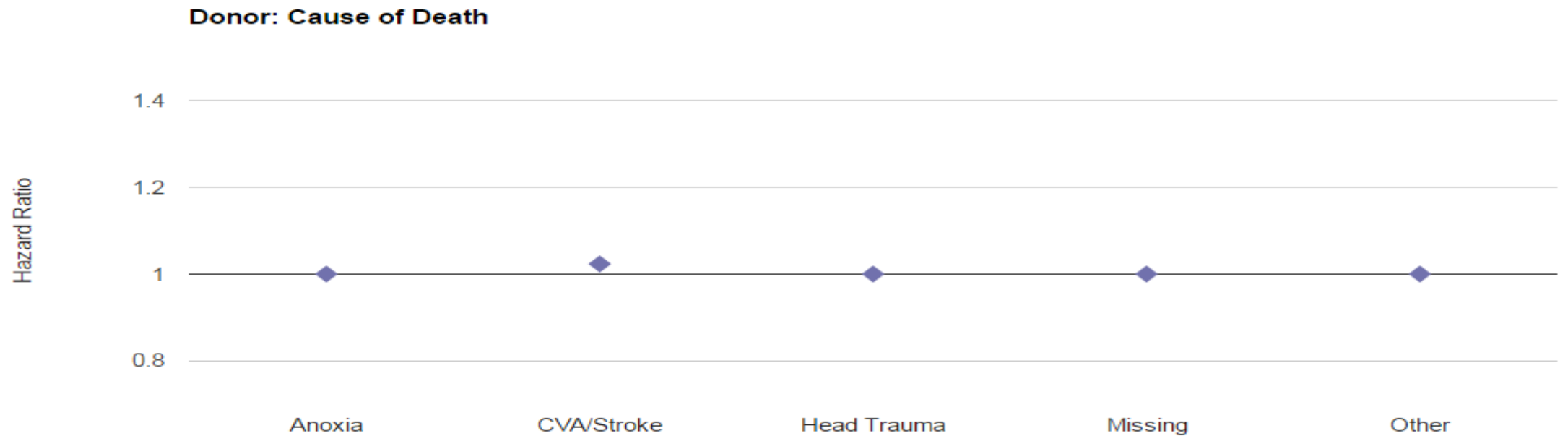
National distribution of HDRI



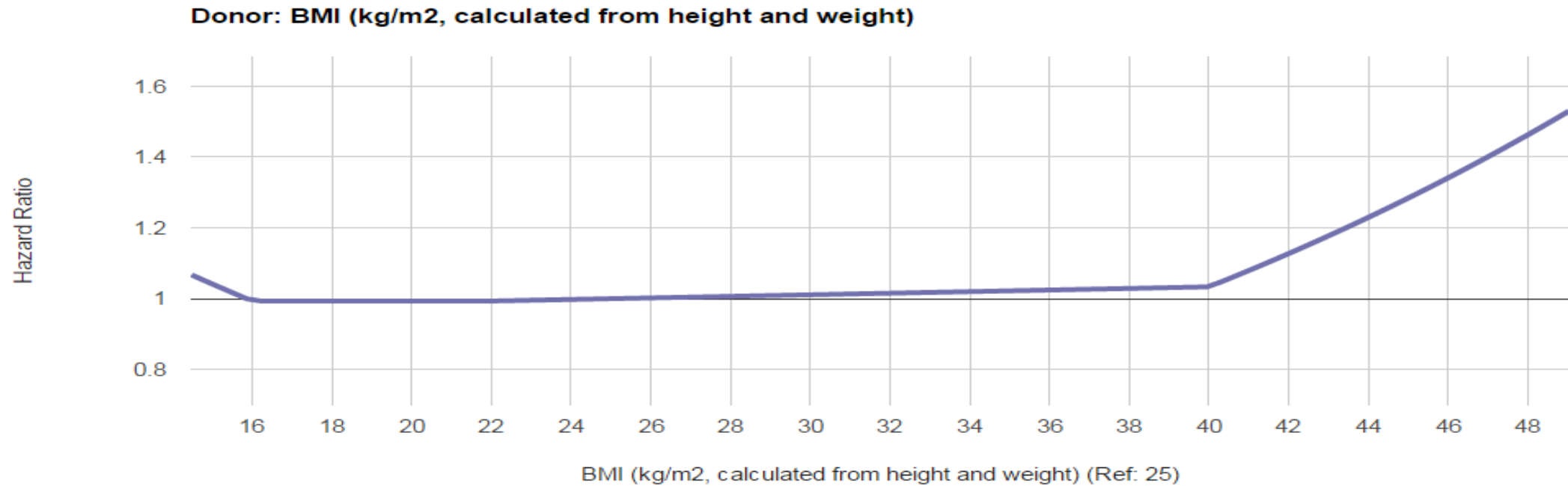
Donor age and risk of allograft failure



Donor cause of death and risk of allograft failure



Donor BMI and risk of allograft failure



Conclusion

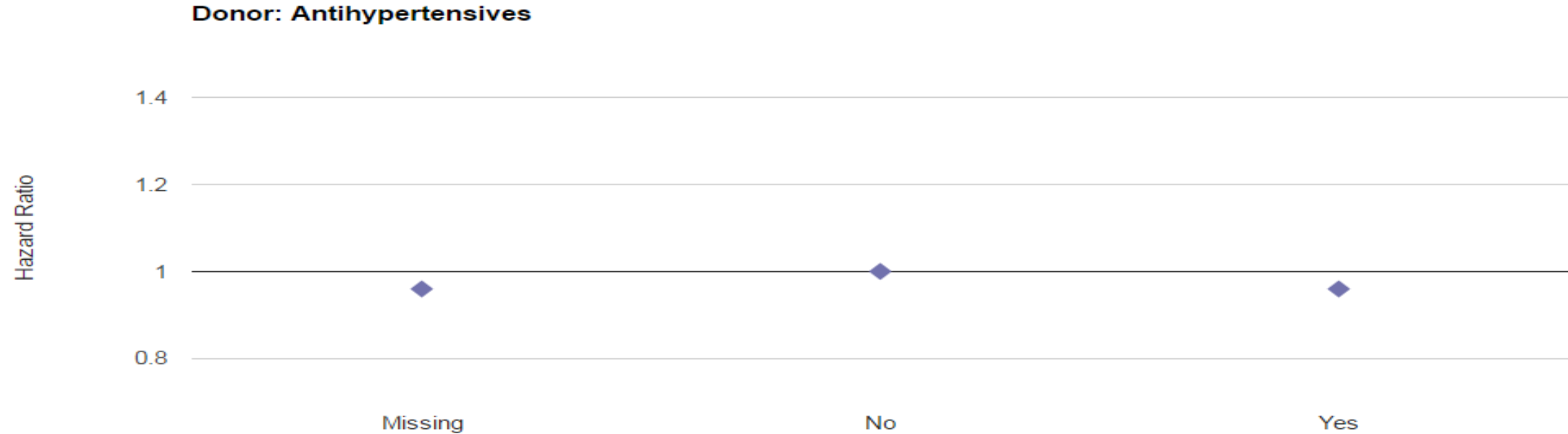
- HDRI developed using program-specific report models.
- HDRI can risk stratify heart donor offers.
- HDRI can be easily updated as donor characteristics change over time.
- Heart transplant community can consider collecting other variables of interest for improving HDRI.

Future Direction & Limitations

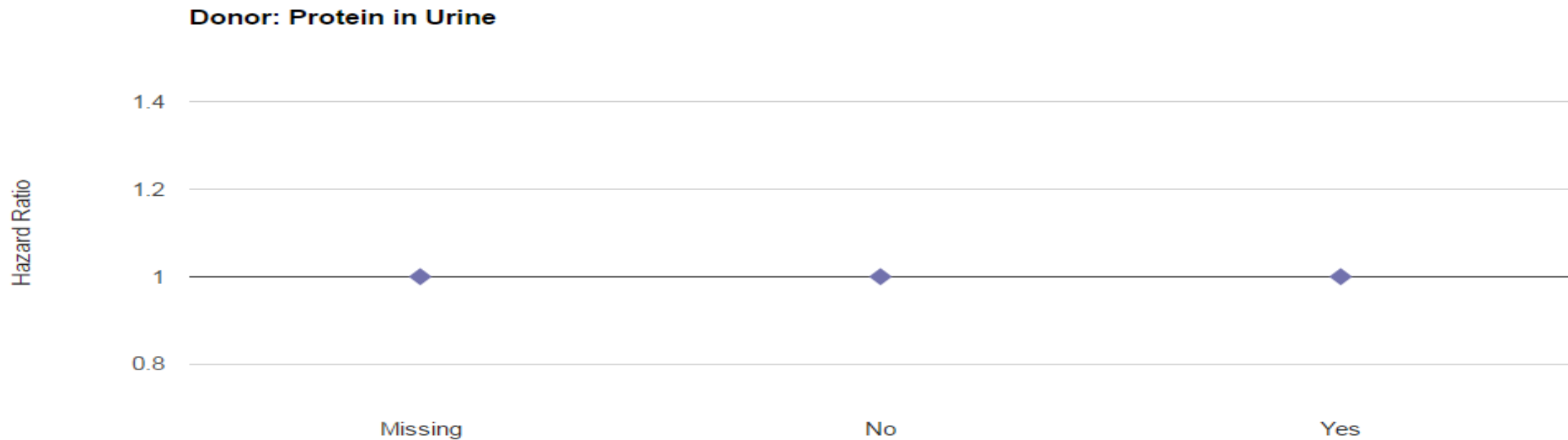
- Clinical utility should be tested and compared with clinical judgement.
- Given that all data are in OPTN database, HDRI can be provided in DonorNet[®].
- Number of variables could be reduced if not done in DonorNet[®].
- Look at utilization and offer acceptance of heart donors with high HDRI.
- Need to incorporate donor heart cath and echo data from DonorNet[®]?
(currently a limitation?)

Extra Slides

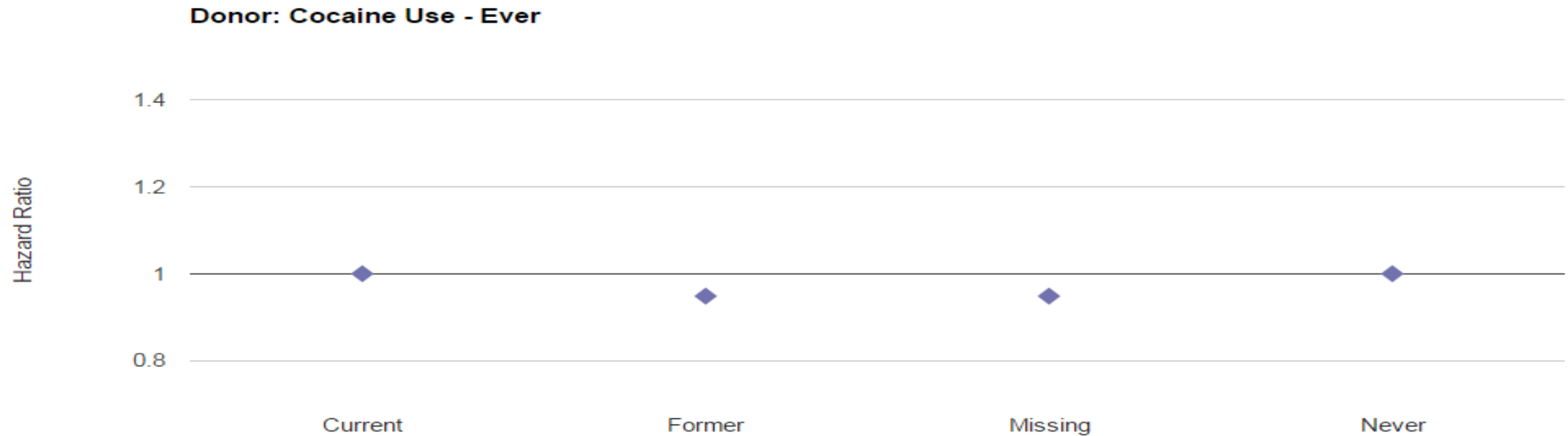
Donor anti-hypertensive medication use and risk of allograft failure



Donor proteinuria and risk of allograft failure



Donor cocaine use and risk of allograft failure



Donor cigarette use and risk of allograft failure

