

Gender discrimination via MELD-based liver allocation

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Introduction

MELD was implemented to guarantee urgency-based and fair organ allocation. Nonetheless men are outnumbering women as liver transplant recipients. The aim of this study was to analyze gender disparities in liver transplantation particularly with regard to organ allocation in a nationwide cohort.

Methods

Adult liver-only candidates and transplantations from 2003 to 2017 in Germany and from 1999-2017 in the US were assessed using data by Eurotransplant and the United Network for Organ Sharing. Living donation and High Urgency Status were excluded. Additionally, data by the federal statistical offices was analyzed.

Results

I. Gender distribution

Between 2003 and 2017 the ratio of females in liver associated cause of death (COD) was 35.0% in Germany with low variability. Despite these constant proportions the ratio of female waiting list candidates and transplantations decreased after the implementation of MELD-based allocation and females are under-represented in transplant recipients compared to COD and candidates (Fig. 1). In the USA gender distributions showed very similar results (not illustrated).

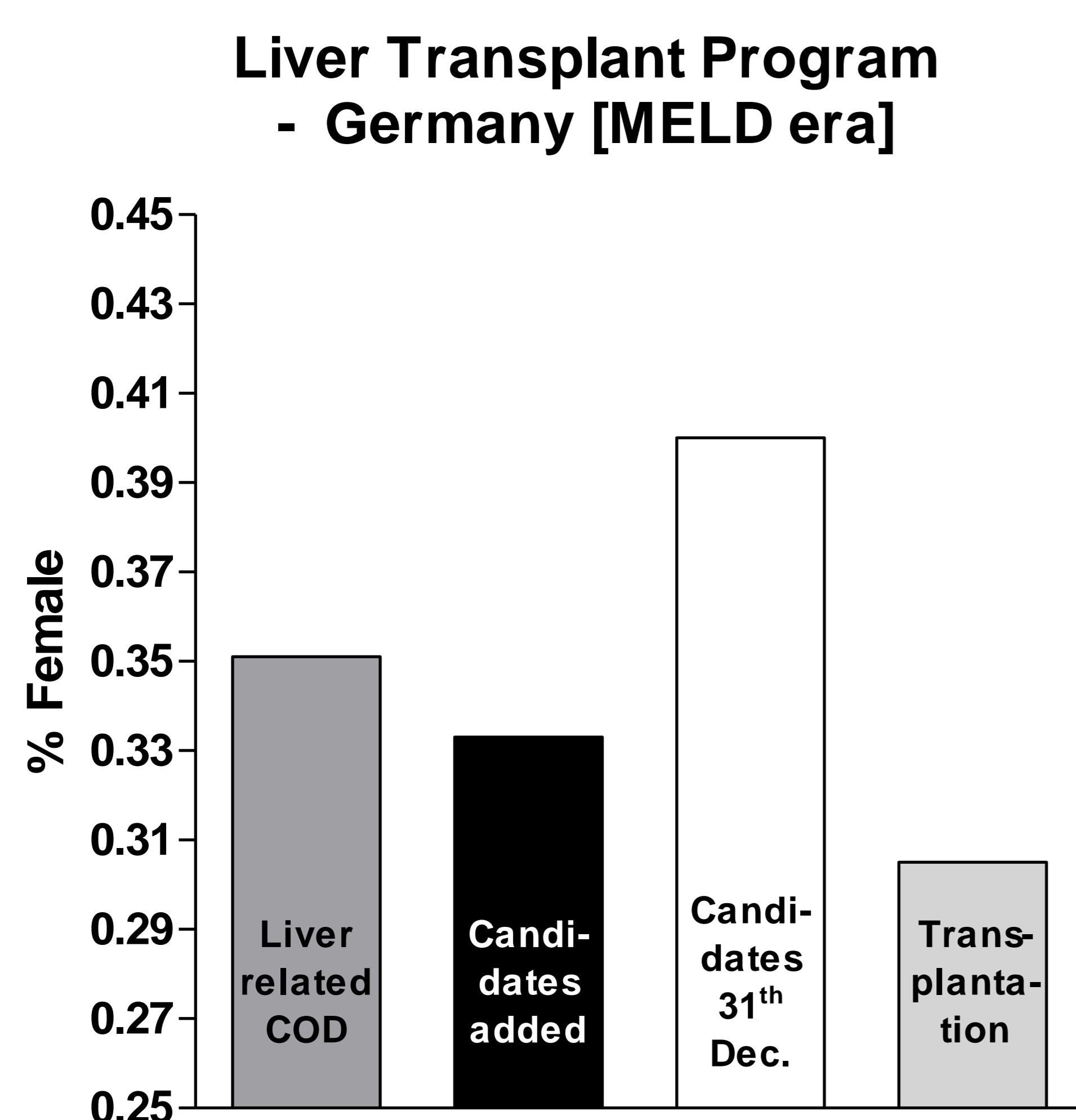
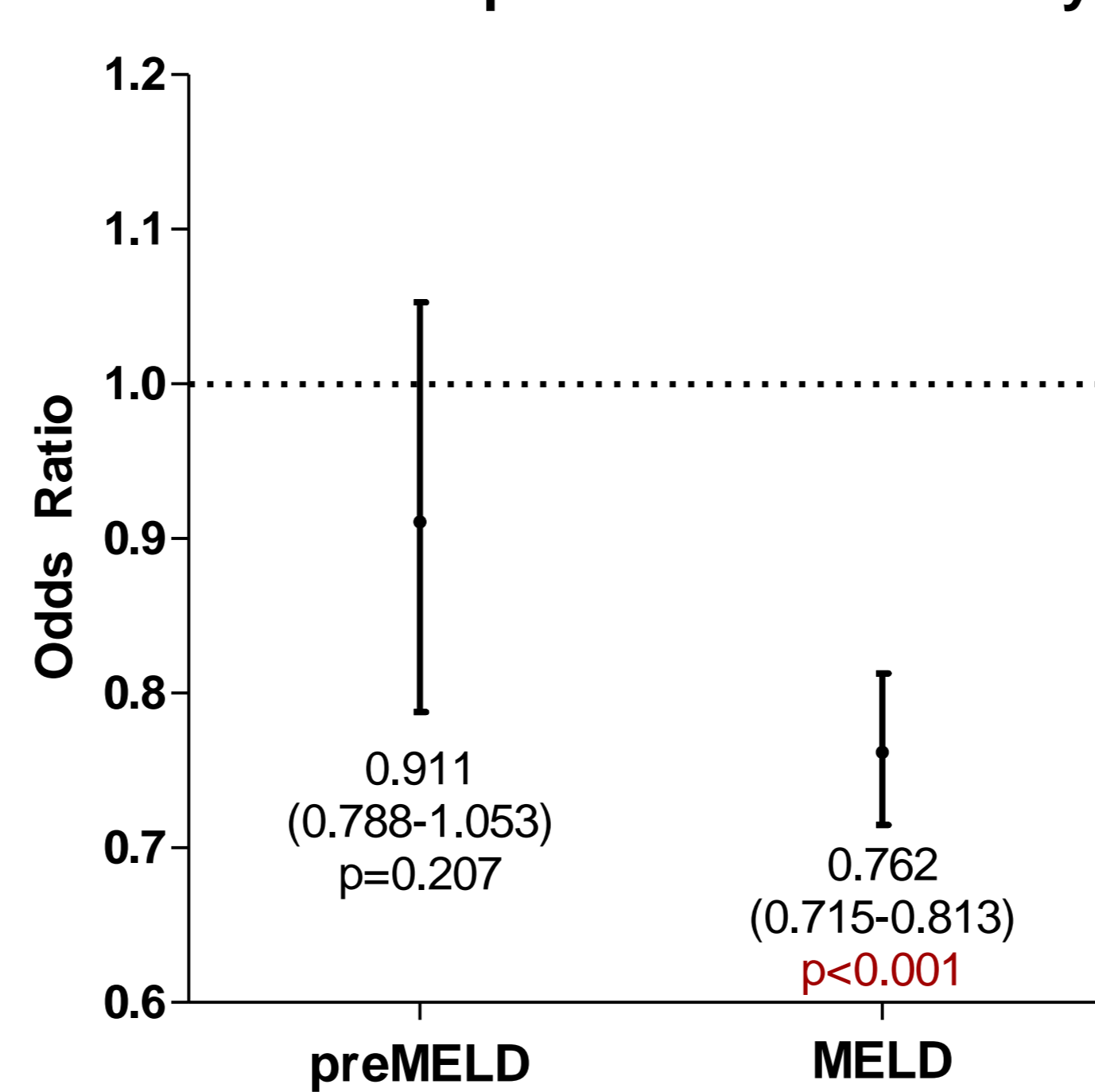


Figure 1. Proportions of women in the German liver transplant program during MELD era.

Female transplant rates - Germany



Adjusted female transplant rates - Germany

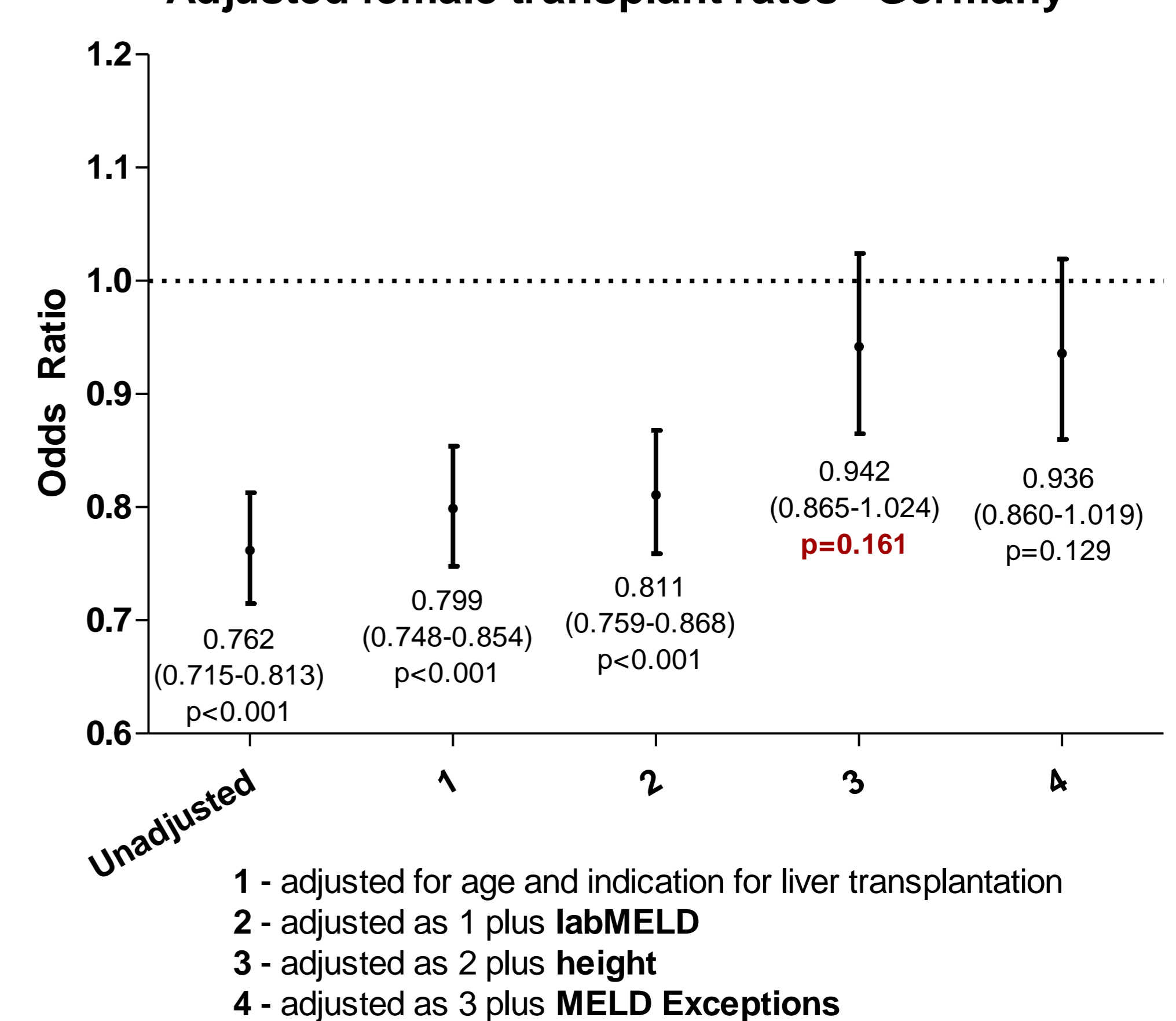


Figure 2. Effects of female sex on transplant rates (logistic regression models).

II. Transplant rates

In Germany female transplant rates did not differ from male transplant rates under the old allocation guidelines, but became significantly lower after the introduction of MELD-allocation (Fig. 2). Adjustment for different covariates showed that recipient age, indication for liver transplantation and labMELD did only explain small parts of these gender differences, but these were largely related to body height.

III. Transplant recipients

LabMELD score was higher in women and included values also differed (Tab. 1). Females had lower creatinine values ($p<0.001$) although their actual renal function indicated via the eGFR was worse ($p<0.001$). Hence, despite being sicker, women do not generate high MELD scores. In addition men are more likely to have an exceptional status (40.4% vs. 36.4%; $p<0.001$) as about 80% of all transplantations for HCC occurred in men.

German cohort - MELD era	Male (5683)	Female (2492)	P-value
Creatinine (mg/dl)*	1.57 (1.26)	1.40 (1.13)	<0.001
Bilirubin (mg/dl)	8.1(10.8)	9.2 (11.2)	<0.001
INR	1.66 (0.97)	1.76 (1.03)	<0.001
GFR	70.5 (34.0)	64.7 (34.6)	<0.001

All: Mean (SD); CDK-EPI formula used for GFR

Table 1: Laboratory values before transplantation of male and female recipients

Summary and Conclusion

MELD-based liver allocation did not guarantee fair allocation in terms of gender equity, as likelihood of transplantation decreased for women. To improve this, the consideration of body size, kidney function and the promotion of HCCs should be reconsidered.