Gender differences in access to lung transplant in the US after LAS implementation

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Introduction

- Since implementation of the U.S. lung allocation score (LAS) system, lung transplant rates have been higher for men than for women.
- We hypothesized that men have increased access to lung transplant because they have higher prevalence of diagnoses that yield higher LAS.

Methods

- LAS was summarized for candidates waiting at any time during a year, 2005-2012; latest LAS in the year was used.
- Transplant rates were calculated as the number of transplants per 100 patient-years of waiting time in a given year.
- Cumulative incidences of transplant and death were computed for candidates newly listed in 2009, 2010, and 2011 as the raw percentage of those undergoing transplant or dying each month after listing.
- Median months to first transplant was estimated using Kaplan-Meier completing risks methods, censoring patients on December 31, 2012.
- All analyses were limited to candidates aged ≥12 years.

Results

- Mean LAS has been steadily increasing since 2005, from 38 in 2005 to nearly 46 in 2012. Men have consistently had slightly higher mean LAS compared to women (Figure 1).
- Lung transplant rates have been more than twice as high for men than women since the LAS system was implemented (Figure 2). The trend is similar for each diagnosis group.
- Among 2,359 candidates newly listed in 2010, 44% were women. Mean LAS at listing was 42 for women and 44 for men. Women were 5 years younger than men on average and more likely to be in Diagnosis Group A or B (34% A and 8% B for women vs. 27% A and 2% B for men). Blood types were similar for men and women, as were diabetes and functional status at the time of listing. Women were 14 cm shorter than men on average, but height distribution has not changed from the pre-LAS to post-LAS era.
- 72% of men and 56% of women newly listed in 2010 underwent transplant within 1 year; 7.6% of women and 9.3% of men died (p=0.16, Figure 3), similar to 2009 and 2011.
- Women are waiting longer for lung transplants, with median waiting time 7-9 months for women vs. 2.5-3 months for men since 2006 (Figure 4), a trend similar for Diagnosis Groups A, C, and D. Diagnosis Group B was excluded because the groups are small.

Figure 1
Lung Allocation Score for lung transplant candidates aged ≥12 years by gender

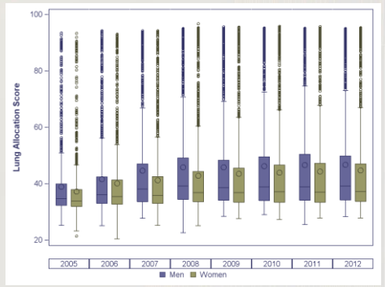


Figure 2
Lung transplant rates among wait-list candidates aged ≥12 years by gender

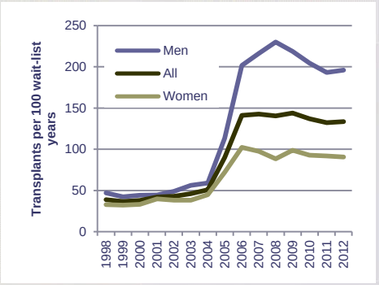


Figure 3
Cumulative incidence of transplantation and death for lung transplant candidates aged ≥12 by gender

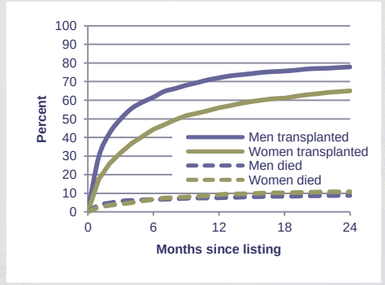
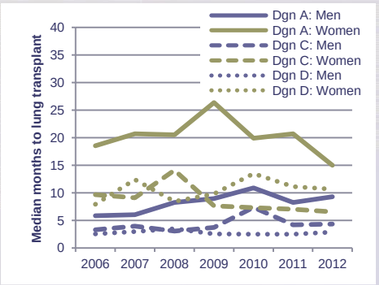


Figure 4
Median months to lung transplant for wait-listed candidates aged ≥12 by gender and diagnosis group



Conclusions

- Women have lower mean LAS and lower transplant rates than men, but we found no evidence that women have higher rates of death on the wait-list as a consequence. Instead, women are waiting longer than men for lung transplants.
- Longer waiting times for women could be due in part to differences in listing practices with women being listed earlier than men, although the functional status of women newly listed in 2010 was similar to that of men.
- Longer waiting times for women could also be due in part to:
  - Lower prevalence of high-LAS-yielding diagnoses than men, like Diagnosis Groups C and D, and
  - Higher prevalence of lower-LAS-yielding diagnoses like COPD and pulmonary fibrosis.
- Our results suggest that women are waiting longer than men for lung transplants because they have lower LAS. Because women are not more likely to die while waiting, LAS system appears to be appropriately prioritizing candidates who have higher risk of death.

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