

# Variation in Waitlisting Rates at the Dialysis Facility Level in the Context of Goals for Improving Kidney Health in the United States



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End-stage renal disease (ESRD) is a condition that affects more than 746,000 people in the United States.<sup>1</sup> Kidney transplantation is more cost-effective than remaining on dialysis, provides ESRD patients with better quality of life, and significantly improves patient survival compared to remaining on dialysis.<sup>2,3</sup> The first step to waitlisting for kidney transplantation requires that a patient is referred for transplant evaluation at a transplant center. Ideally, the referral process is initiated by a nephrologist at a chronic kidney disease clinic, before a patient starts dialysis, or at a dialysis facility once a patient has progressed to ESRD. The majority of transplant referrals originate at dialysis clinics; thus, the dialysis facility processes and performance may be significant factors contributing to waitlisting. Whereas substantial variation in transplant rates exists at the dialysis facility level,<sup>4</sup> it is currently unknown how much the likelihood of waitlisting varies across dialysis facilities. Dialysis facilities play an integral role in the transplantation process because dialysis facility staff are responsible for educating patients about transplantation, referring patients for transplant evaluation, and maintaining the health of patients after waitlisting to ensure they remain eligible for transplantation. Coordination between dialysis units and transplantation centers may allow dialysis facilities to decrease the number of patients likely to be deemed “unsuitable for transplant” that they refer and/or recommend patients seek care elsewhere in the event that they are unlikely to meet a given center’s criteria.

Historically, there have been no national policies or metrics to incentivize transplant access at the dialysis facility level, but more recently there have been several

policy initiatives to incentivize dialysis facilities to increase waitlisting. In December 2017, the Centers for Medicare and Medicaid Services proposed a new metric for dialysis facilities — the Percentage of Prevalent Patients Waitlisted<sup>5</sup> — to monitor access to the transplant waiting list. The Centers for Medicare and Medicaid Services also has required ESRD networks across the country to participate in quality improvement projects with a goal of increasing waitlisting by 1.25% over baseline per year. In July 2019, the Advancing American Kidney Health (AAKH) initiative launched, setting ambitious goals for improving the care of Americans with kidney disease.<sup>6, S1</sup> AAKH implemented multiple payment models, including the ESRD Treatment Choices Model on January 1, 2021, that aims to incentivize increased use of both home dialysis and transplantation.<sup>6</sup> AAKH aims to have 80% of incident ESRD patients treated by home dialysis or transplantation by 2025. However, in contrast, a major change in the kidney allocation system (KAS) in 2014 has led to a decreased incentive for transplantation centers to waitlist some dialysis patients because patients no longer receive extra waiting time by being waitlisted sooner under KAS. In addition, because many patients received large boosts in prioritization, new ESRD patients may have felt less need to immediately pursue waitlisting because they would be unlikely to receive a transplant until the backlog of waitlisted patients is cleared. Although pre-emptive waitlisting has increased, declines in overall waitlisting have been observed since KAS was implemented.<sup>1,7</sup>

In context with these new policy initiatives, it is pertinent to understand historical and current trends in waitlisting at the dialysis facility level to evaluate the

feasibility of some of the new initiatives and policies to increase access to transplantation. Whereas prior studies have examined dialysis facility-level variation in transplantation, no national studies have examined dialysis facility variation in waitlisting rates.<sup>4</sup>

## METHODS

Detailed methods are described in the [Supplemental Appendix](#). This study was designed to describe current variation in prevalent waitlisting rates across dialysis facilities and regions, as well as to examine historical trends in prevalent waitlisting rates over time. These results are intended to help inform potential targets for intervention at the dialysis facility level within the context of the goals set out by the Centers for Medicare and Medicaid Services and AAKH.

## RESULTS

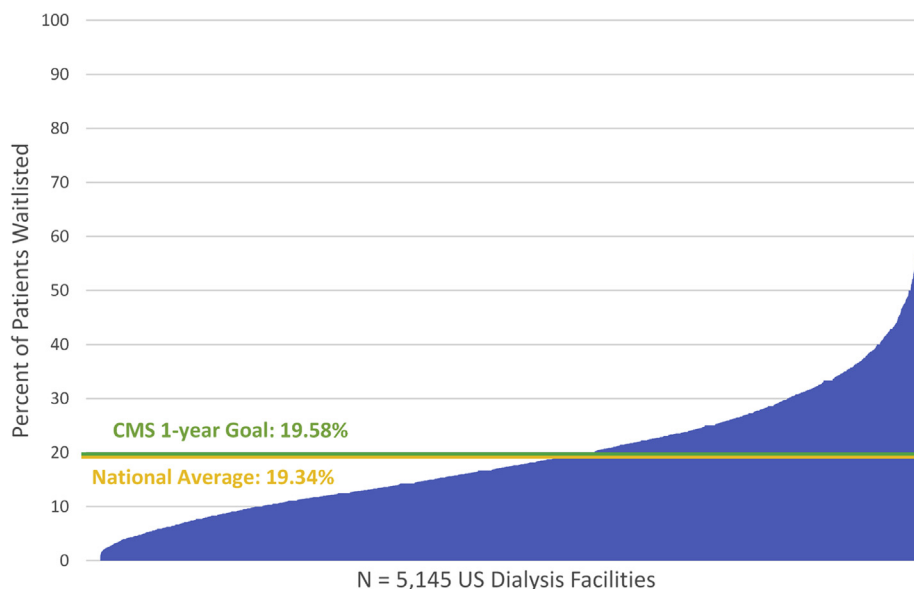
A total of 5054 facilities across the United States (24,547 observations) from 2012–2017 Dialysis Facility Reports data with complete covariate data were included ([Supplementary Figure 1](#)). In 2017, there was wide variation in waitlisting rates at the dialysis facility level, ranging from 0% of patients waitlisted to 92.3% ([Figure 1](#)). The average percent of patients waitlisted at a given facility in 2017 was 19.3%. When examining the 3-year average facility-level waitlisting rates from pre- to post-KAS, the average change in dialysis facility waitlisting rates was -2.85 percentage points (pp) (range, -37.41pp to 33.73pp) ([Figure 2](#)).

In our model adjusted for patient and facility characteristics, KAS reduced prevalent waitlisting rates by

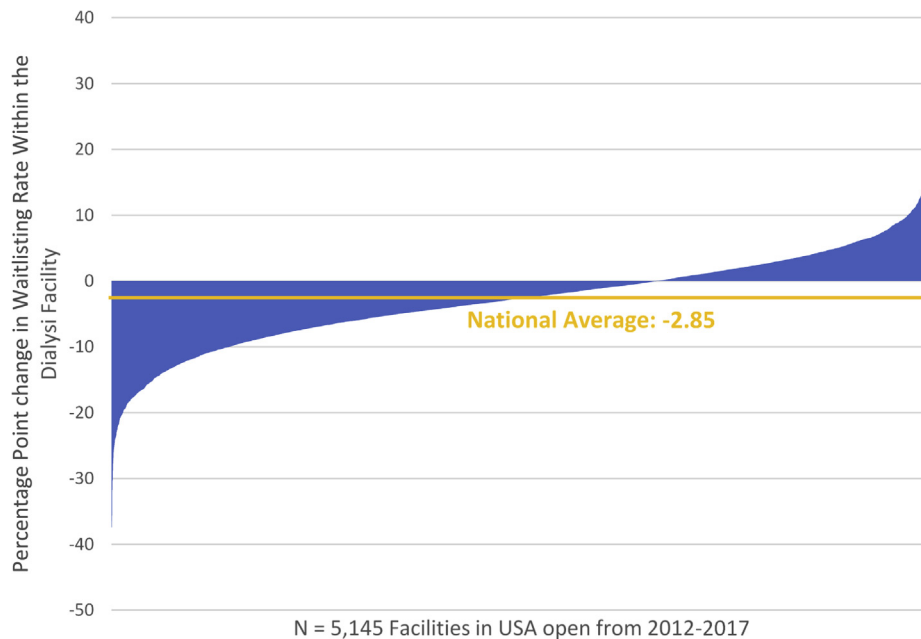
4.4 pp ([Supplementary Figure 2](#)). Treatment within a nonprofit dialysis facility was associated with an increase of 1.79 pp in the waitlisting rate, compared to for-profit facilities. The number of dialysis stations at a facility was negatively associated with waitlisting rate (-0.08 pp per additional station), whereas the number of patients seen at a facility was positively associated with the waitlisting rate (0.02 pp per additional patient). The proportion of patients informed about transplantation was also positively associated with the waitlisting rate (0.02 pp for each additional percent of patients informed). Compared to facilities in the South, facilities in the Northeast, West, and Midwest had significantly higher waitlisting rates (6.74 pp, 2.13 pp, and 0.39 pp higher, respectively). The proportion of patients at a facility who received 12+ months of pre-ESRD nephrology care was associated with increased waitlisting rates (0.02 pp per percent increase). The proportions of patients who began dialysis on a fistula or graft were both associated with increased waitlisting rates (0.07 pp and 0.06 pp, respectively).

## DISCUSSION

As of 2017, among the more than 5000 dialysis facilities in the United States, the proportion of patients waitlisted varied substantially and only 19.3% of prevalent patients were waitlisted. Whereas the number of ESRD patients suitable for transplantation likely varies by facility, it is unlikely that an average of more than 80% of prevalent patients at a given facility are ineligible for transplantation. We do not have specific data to provide context on whether lower waitlisting rates at some centers are due to center selectivity of patients or organ acceptance, but we believe investigation of these center-level characteristics is needed. Our findings confirm



**Figure 1.** Variation in waitlisting rates across U.S. Dialysis Facilities in 2017. Data from the Dialysis Facility Report.



**Figure 2.** Change in 3-year average dialysis facility waitlisting rate from pre-kidney allocation system (KAS) (2012–2014) to post-KAS (2015–2017), at the dialysis facility level. Data from the Dialysis Facility Report.

previous studies<sup>1,7</sup> showing that the number of waitlisted patients has continued to decline post-KAS and extend this work by describing the extreme variation in waitlisting at the dialysis facility level.

Although many dialysis facility characteristics are associated with waitlisting rates, our findings do not suggest that any one characteristic is likely able to produce the increase in waitlisting that is needed to meet policy goals. Our findings provide potential targets for intervention at the dialysis facility level that may have been missed by prior patient-level analyses. Patient education and pre-ESRD care continue to be valuable tools to improve waitlisting, but they seem unlikely to be sufficient on their own.

The Centers for Medicare and Medicaid Services' proposed 1.25% increase per year in Percentage of Prevalent Patients Waitlisted is an ambitious goal given recent trends showing declines in waitlisting nationally.<sup>1</sup> From pre-KAS (2012–2014) to post-KAS (2015–2017), average Percentage of Prevalent Patients Waitlisted at the dialysis facility level declined an average of 2.85 pp. To put this into context, the average Percentage of Prevalent Patients Waitlisted in 2017 at the facility level was 19.34% which means an increase of 1.25% would increase that to 19.58%. Such an increase would be a step in the right direction but is unlikely to reach the aims of the AAKH.

According to the United States Renal Data System, in 2016 the United States had 124,675 incident ESRD patients, 9.7% on peritoneal dialysis, 0.3% on home hemodialysis, and 2.8% with a pre-emptive transplant. During the same year, a total of 20,161 kidney

transplantations were performed.<sup>1</sup> This means that 108,717 (87.2%) of incident patients did not start ESRD treatment via transplant or home dialysis. Even if all transplants in 2016 had been given to incident ESRD patients, there would still be 88,556 (70.5%) incident patients not being treated via transplant or home dialysis. To achieve the goal of 80% of incident ESRD patients being treated via transplant or home dialysis, we need additional strategies and policy incentives to promote a massive increase in the number of available donor organs and start more patients on home dialysis. Patient education has been linked to pre-ESRD nephrology care, higher likelihood of permanent vascular access at dialysis initiation, pre-emptive transplant waitlisting, and transplantation<sup>8,9</sup>; however, education alone will not address this important problem. The AAKH is a bold effort to encourage providers to improve the care of ESRD patients, but its proposed incentives do not provide a clear path to coordination between transplantation centers and dialysis facilities,<sup>6</sup> something that is likely a necessary step on the path to increasing waitlisting and improving the care of patients with ESRD.

## ACKNOWLEDGMENTS

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## SUPPLEMENTARY MATERIAL

[Supplementary File \(PDF\)](#)

**Supplementary Methods**

**Figure S1.** Inclusion Criteria for study population (2012-2017)

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