The Covid-19 pandemic has posed particular risks to people with end-stage kidney disease, not only from Covid-19 infection, but also from disrupting dialysis center operations and limiting access to transplantation and other surgical procedures. ESKD (also called end-stage renal disease, or ESRD) disproportionately affects people of color and individuals with low incomes, multiplying the damaging effects of Covid-19 in those communities. At the same time, the pandemic has required much routine medical care to be moved away from hospitals and clinics and into patients’ homes, confirming that home care — including home dialysis — can be safe and effective. For complex reasons, most dialysis is delivered in for-profit centers even when home dialysis is feasible and preferable. The pandemic may be our best opportunity to expedite a shift from center-based dialysis to home-based dialysis to benefit patients and provide higher quality, less expensive, and more convenient care. Accomplishing this goal will require changes in regulations, financial incentives to health care providers, education of both providers and patients, and better coordination among the many programs devoted to improving kidney care.

Covid-19 has placed people of color and individuals with low incomes at distinct disadvantage. Beyond being at increased risk of exposure because they are more likely to hold low-wage and public-facing jobs, such persons also often live in crowded, poor-quality, and multigenerational housing that limits ability to socially distance. Those with multiple chronic conditions have experienced elevated risk of Covid-19 hospitalizations and death.¹²

One important contributing factor to this disparity is that these communities bear a disproportionate burden of kidney disease, which turns out to be a significant risk factor for hospitalization and death due to Covid-19.
The Centers for Disease Control and Prevention (CDC) CKD Surveillance Team indicates that 15% of the U.S. adult population has chronic kidney disease (CKD), including 16% of non-Hispanic Black adults, 14% of Hispanic adults, 13% of non-Hispanic Asian adults, and 13% of non-Hispanic white adults. Prevalence is higher among individuals with lower educational attainment and income.

Many people with CKD eventually develop end-stage kidney disease (ESKD). In 2018, compared with white people, the prevalence of ESKD was about 3.4 times greater in Black Americans, 1.8 times greater in American Indians/Alaska Natives, and 1.3 times greater in Asian Americans.

The proportion of new ESKD patients who reside in high poverty areas (those with 20% or more of households living below the federal poverty line) has increased in recent years to 34%, reflecting that people living with kidney failure in this country are often some of the most socially vulnerable Americans.

Medicare is the universal health insurance provider for Americans with ESKD. Data from the Centers for Medicare & Medicaid Services (CMS) shows that during the first peak of the Covid-19 pandemic, ESKD beneficiaries were hospitalized 7.5 times more than older adult or disabled Medicare beneficiaries, and mortality increased by 40% for dialysis patients and 60% for transplant recipients, prior to their pre-pandemic mortality rates.

Acute kidney injury has also been documented in the setting of Covid-19 infection, with Black individuals being at greater risk for acute kidney injury than white individuals.

**Caring for ESKD Patients During Covid-19**

Most dialysis — the predominant form of treatment for ESKD — is delivered in dialysis centers, many of which experienced significant Covid-19 outbreaks among staff and patients. While home dialysis substantially reduces that risk, people of color are well documented to be less likely to initiate dialysis with a home therapy than are white people, underscoring amplified risk of poor outcomes for people of color with ESKD during the pandemic.

"Medicare spends $114 billion on kidney disease, with $35 billion on the care of individuals with ESKD, who represent 1% of Medicare beneficiaries but 7% of its total budget."

Covid-19 has reduced access to non-emergent surgeries and other procedures, and this reduction has had a major deleterious impact on the timely provision of surgical procedures such as vascular access surgery that are required to optimize dialysis care, particularly in geographic regions experiencing high rates of Covid-19 infection. There were already disparities in the receipt of these surgical procedures prior to Covid-19. The pandemic has likely made them worse.
Similarly, in the early months of the Covid-19 pandemic, more than 75% of kidney transplantation programs were either suspended or operating under restrictions, and the return to full capacity has been slow in many areas.\textsuperscript{12} This impact on transplantation is likely to be felt most profoundly among socially disadvantaged patient populations, who, again, had reduced access to transplantation even prior to Covid-19.\textsuperscript{13}

**Medicare and ESKD Care**

All ESKD patients in the U.S. receive their care through Medicare. Coverage of ESKD was signed into law in 1972.\textsuperscript{14} Medicare spends $114 billion on kidney disease, with $35 billion on the care of individuals with ESKD, who represent 1% of Medicare beneficiaries but 7% of its total budget. The majority of ESKD costs are spent on patients who receive hemodialysis in outpatient clinics 3 times per week for 3 to 4 hours per treatment. Each dialysis patient is admitted to the hospital 1.58 times per year with an average length of stay of 9.4 days per year.\textsuperscript{5}

Sixty percent of patients start dialysis while hospitalized and have a central venous catheter placed to access their blood for hemodialysis.\textsuperscript{15}

Receiving a kidney transplant is the best modality for treating ESKD; however, locating a compatible kidney can take years, which ESKD patients must spend undergoing dialysis. These years take a toll: depressive symptoms occur in approximately one-third of dialysis patients.\textsuperscript{16} These and other mental challenges make it difficult for ESKD patients to manage their health effectively.

**The Role of For-Profit Dialysis Centers**

Restrictive, outdated federal and state regulations require all providers receiving Medicare reimbursement to become certified dialysis facilities and meet lengthy prescriptive requirements, many of which duplicate existing patient safety regulations that already govern health care providers.

The burden of these extra regulations is one reason that the rest of the health care system has tended to cede the provision of dialysis to freestanding for-profit dialysis centers that make regulatory compliance a central feature of their business model. Two Fortune 500 companies, DaVita Kidney Care and Fresenius Medical Care, provide dialysis to more than 73% of U.S. ESKD patients.\textsuperscript{17} These companies’ profitability depends on keeping their centers as close to capacity as possible.

"Restrictive, outdated federal and state regulations require all providers receiving Medicare reimbursement to become certified dialysis facilities and meet lengthy prescriptive requirements, many of which duplicate existing patient safety regulations that already govern health care providers."

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But should dialysis center profits come at the expense of the best interests of patients? Though it is often feasible to receive dialysis at home, only about 12.5% of patients use home dialysis today, with 10.5% undergoing peritoneal dialysis [which uses the lining of the abdomen (peritoneum) as a filter and removes waste products from the blood] and less than 2% undergoing home hemodialysis. Nephrologists themselves realize that dialysis centers are not optimal care: a majority would choose home hemodialysis for themselves or a family member if they had kidney failure and required dialysis, followed by peritoneal dialysis. Home dialysis is less expensive: Medicare spends $93,191 on mostly in-center hemodialysis patients and $78,741 on mostly home peritoneal dialysis patients.

Yet patients often report not being provided a choice or being judged to be unfit for home dialysis, despite few absolute contraindications to home dialysis.

Conflicts of interest pose one obstacle to changing this pattern of care. Many nephrologists have joint ventures and medical directorships with dialysis facilities. Those arrangements often require nephrologists to sign non-compete contracts that can be multiyear prohibitions on working with competitors in a certain geographic area. The extent of these agreements and the impact they have on patient care is not well studied and data is difficult to obtain.

Reforming ESKD Care

Simple changes to the regulations could allow for dialysis to more easily be provided within existing health care settings, and reduce requirements placed on home dialysis training and support programs. Such changes could broaden the options for better coordinated kidney care and patient-centered dialysis.

There are compelling reasons to expedite this shift. When transplant is not an immediate option, home dialysis can help patients stay activated in their care, which may lead to improved outcomes.

We believe that ESKD care needs the following critical reforms:

- Easier to use home dialysis technology
- Provider education on the benefits of home dialysis, to reduce the existing bias in favor of center-based care
- Patient education to empower home dialysis
- Support for patients to maintain treatment on a home modality

In addition, financial conflicts of interest, reimbursement, and regulations must be reformed to address the entrenched interests of delivering in-center dialysis.

At its November 2020 meeting, the Medicare Payment Advisory Committee (MedPAC) noted the challenges and high costs associated with consolidation of the dialysis market and its impact
Coordinating Existing Programs and Agencies

To move toward the home-based model for dialysis that we describe above, and propagate other evidence-based improvements in kidney care, we believe the executive and legislative branches of the federal government must address a larger issue with the development of kidney care policies and programs. ESKD, widely and correctly recognized as a public health issue, has inspired multiple federal efforts staffed by committed, passionate civil servants quietly doing their part to drive forward improvement in kidney care. However, these programs often receive little attention, funding, and coordination. Attempts at coordination have stalled and sometimes fallen short in the absence of support from political leadership. Table 1 and Table 2 provide an overview of current initiatives across the Department of Health and Human Services (HHS) aimed at improving outcomes for people with CKD.

Although it is often feasible to receive dialysis at home, only about 12.5% of patients use home dialysis today."

The Medicare ESRD program represents the first example of bipartisan support for a single-payer system in the United States. To ensure its sustainability and extend its benefits to improving kidney health generally, a public health approach to CKD will require coordination across all of the agencies and departments within HHS. For this reason, we recommend a division of Kidney Health...
Coordination be established within HHS under the office of the Assistant Secretary of Health to tackle these ongoing challenges that contribute to inequities in health in America.

Ensuring the right leadership and staff is in place at HHS to coordinate kidney policy actions across the various agencies will improve the success of these initiatives and drive efficiencies to ensure that public health spending on kidney care delivers high value.

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Table 2. CMS Initiatives

| Center | Initiative |
|--------|------------|
| Center for Medicare (CM) | ESRD Prospective Payment System  
New technology adjusters  
Physician Fee Schedule  
Nephrologist reimbursement |
| Center for Clinical Standards and Quality (CCSQ) | Quality Incentive Program for dialysis facilities  
Dialysis Facility Compare and star ratings  
Merit-based incentive payment system (MIPS) quality measures related to kidney care  
ESRD Conditions for Coverage, requirements to be a Medicare certified dialysis provider  
Quality Improvement Organizations and ESRD Networks have developed quality improvement projects and goals for health care providers and dialysis providers to improve outcomes for kidney patients  
Quality metrics and regulations of Organ Procurement Organizations |
| Center for Medicare and Medicaid Innovation (CMMI) | CMMI has a key role in advancing and testing value-based health care and in 2015, launched the first value-based kidney demonstration Comprehensive ESRD Care (voluntary participation with shared savings and risk, 2015–2020)  
ESRD Treatment Choices (mandatory positive and negative payment adjustments to encourage increases in transplant and home dialysis; applies to 30% of beneficiaries’ nephrologists and dialysis facilities January 1, 2021 – June 30, 2027)  
Kidney Care Choices (voluntary with four tracks including a physician led track, and three contracting entity tracks of varying levels of shared risk beginning April 1, 2021) |
| Office of Minority Health | Publishes data and statistics on disparities in health among minority populations  
Began developing CKD educational materials in 2018 aimed at educating primary care clinicians about early CKD detection |

Source: The authors.
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