Nguyen KH, Thorsness R, Swaminathan S, Mehrotra R, Patzer RE, Lee Y, et al.
Despite national declines in kidney failure incidence, disparities widened between low- and high-poverty US counties.
Health Aff (Millwood). 2021;40(12).

APPENDIX
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Detailed Description of Study Methods

1. Assignment of Incident Kidney Failure Patients to Counties

We used patient mailing addresses, as reported on the Medical Evidence Form (CMS 2728) to assign incident kidney failure patients to counties. For patients with incident kidney failure between January 1, 2000 and December 31, 2009, we used county boundaries from the 2000 Census. For patients with incident kidney failure between January 1, 2010 and December 31, 2017, we used county boundaries from the 2010 Census, because county lines can change over time. Between 2000 and 2010, six counties were created, four counties were deleted, and eight counties had substantial boundary changes.[1]

We used patient addresses to geocode and geolocate patients within counties using ArcGIS spatial mapping software, version 10.5.1 (ESRI). The Census Bureau provides cartographic boundary files for geographic information system (GIS) software. For addresses that could not be geocoded, ZIP codes were linked to ZIP Code Tabulation Areas (ZCTAs) with a crosswalk file. We then used a ZIP code-to-county crosswalk file developed by the Missouri Census Data Center's Geographic Correspondence Engine.[2] Because it is possible for ZIP codes to cross county lines, the crosswalk includes a variable, "allocation factor," which is the proportion of total ZCTA population that resides in the county. Most incident patients (96.1%) were assigned to a county either by geocoding their mailing address or on the basis of a one-to-one match with their ZIP code.

Incident patients living in ZCTAs that crossed county lines were assigned to the county where the majority of the ZCTA's population resided (3.9%).

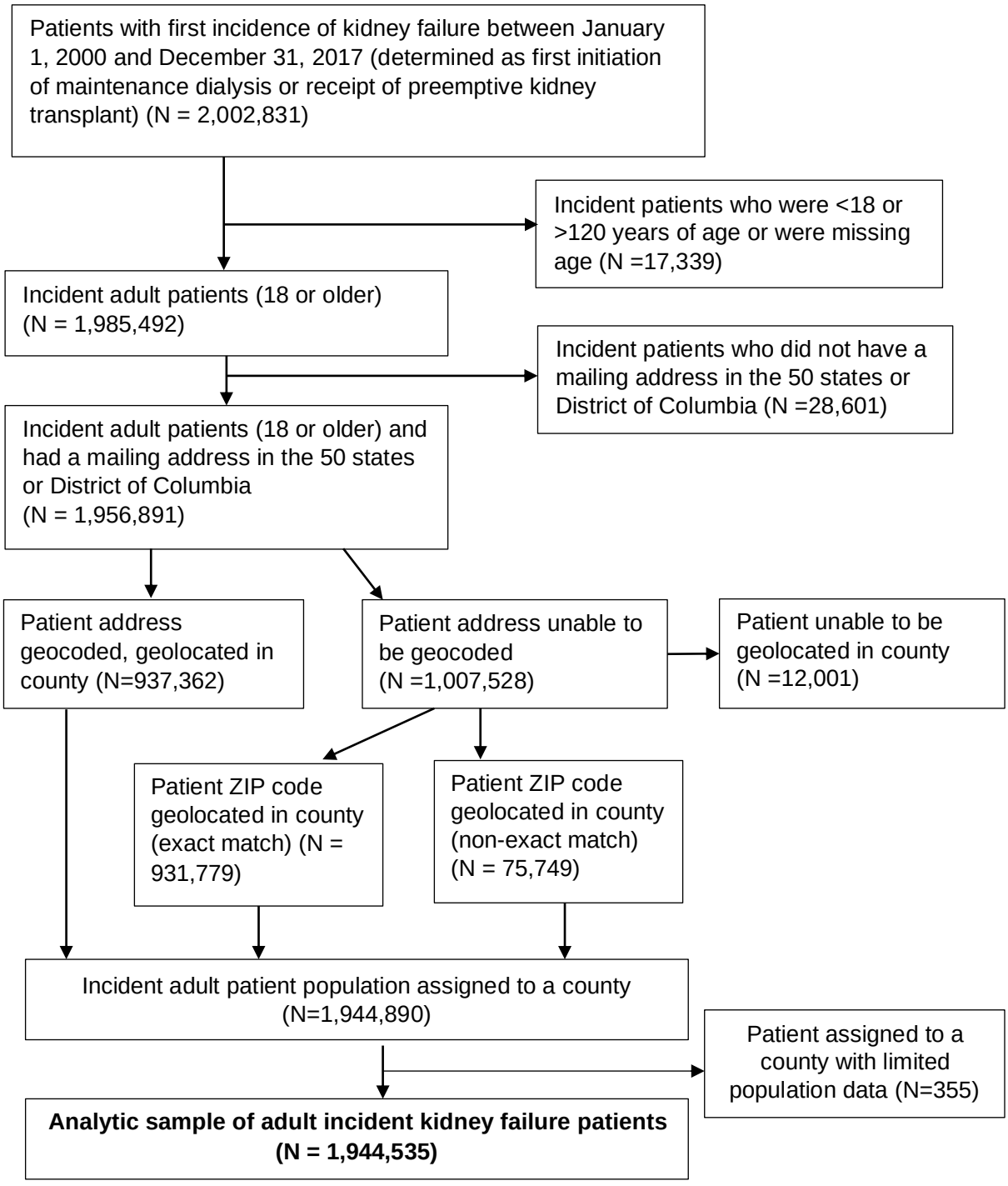
2. Assignment of Poverty Quintile

The US Census' Small Area Income and Poverty Estimates data provides the county-level proportion of people living below poverty annually.[3] Poverty status compares total annual family income to federal poverty thresholds. Thresholds are dependent on total annual family income, family size, number of related children, and age of householder, and are updated annually by the Census Bureau. We assigned each county to a poverty quintile based on each year's distribution of proportion of the population living below poverty. Quintiles were equal in size.

Below we present the mean (SD) county-level proportion of the population living below poverty for each quintile in each period.

Quintile	Overall (2000-2017)	Period 1 (2000-2005)	Period 2 (2006-2011)	Period 3 (2012-2017)
1 (Lowest Poverty)	8.4 (1.8)	7.4 (1.5)	8.7 (1.8)	9.0 (1.7)
2	11.8 (1.3)	10.5 (0.8)	12.3 (1.1)	12.6 (1.0)
3	14.6 (15.8)	13.0 (0.9)	15.2 (1.2)	15.6 (1.2)
4	17.9 (1.9)	16.1 (1.3)	18.5 (1.4)	19.0 (1.4)
5 (Highest Poverty)	24.9 (5.1)	22.5 (4.4)	25.7 (5.0)	26.4 (5.1)

Appendix Exhibit 1A. Construction of Study Sample



Appendix Exhibit 2A. Data Sources

Variable	Data Source(s)
Numerator: Incident kidney failure cases	End-Stage Renal Disease Medical Evidence Report (CMS 2728)[4]
Denominator: County-level population of adults 18 and older	2000-2017 U.S. Census Bureau Annual County Population Estimates[5]
County-Level Characteristics	
Percent of the population living below the poverty line	2000-2017 Small Area Income and Poverty Estimates[3]
Percent of the population who are Hispanic	2000-2017 National Center for Health Statistics (NCHS) Bridged Race Files[6,7]
Percent of the population who are Black	2000-2017 NCHS Bridged Race Files[6,7]
Percent of the population who are Asian	2000-2017 NCHS Bridged Race Files[6,7]
Percent of the population who are American Indian or Alaska Native	2000-2017 NCHS Bridged Race Files[6,7]
Median household income	2000-2017 Small Area Income and Poverty Estimates[3]
Urban-Rural continuum code	U.S. Department of Agriculture (2003[8] and 2013[9])
Educational attainment (percent of adults age 25 years and older with a high school diploma only)	U.S. Census Bureau (2000), American Community Survey 5-Year File (2014-18). Estimates made available by the U.S. Department of Agriculture Economic Research Service[10]
Unemployment rate, age 16+	U.S. Bureau of Labor Statistics Local Area Unemployment Statistics (2000-2017)[11]
Uninsurance rate, adults age 18-64	U.S. Census Small Area Health Insurance Estimates (2005-2017)[12]
Diagnosed diabetes prevalence (proportion of adults age 20 or older who report a previous diabetes diagnosis)	Institute for Health Metrics and Evaluation (IHME) Diabetes prevalence by county (2000-2012)[13], Centers for Disease Control and Prevention Diabetes Surveillance System (2013-2016)[14]
Doctors per 1,000 population	Health Resources and Services Administration Area Health Resource File (2000, 2005, 2010-2017)[15]
Number of dialysis facilities per capita	CMS Dialysis Compare (2001-2017)[16]

Appendix Exhibit 3A. Excluded Counties

State	County or County Equivalent Name (FIPS Code)	Total Incident Kidney Failure Patients Excluded *	Average Annual Adult Population, Mean (SD)
Alaska	Hoonah-Angoon Census Area (02105) Petersburg Borough (02195) Prince of Wales-Hyder Census Area (02198) Prince of Wales-Outer Ketchikan Borough (02201) Skagway Municipality (02230) Wade Hampton Census Area (02270) Wrangell City and Borough (02275) Wangell-Petersburg Borough (02280)	**355**	**3,114 (2,538)**
Hawaii	Kalawao (15005)		
South Dakota	Oglala Lakota County (46102) Shannon (46113)		
Virginia	Bedford City (51515)		

Note . * County-level count of incident kidney failure patients not included due to small numbers.

Appendix Exhibit 4A. Definitions for Cause-Specific Kidney Failure and Stratified Analyses

Cause-Specific Analyses	Numerator	Denominator
Diabetes or Hypertension	County-level incident kidney failure cases where primary cause of kidney failure was diabetes or hypertension	County-level adult population
Diabetes Only	County-level incident kidney failure cases where primary cause of kidney failure was diabetes	County-level adult population
Hypertension Only	County-level incident kidney failure cases where primary cause of kidney failure was hypertension	County-level adult population
Other Primary Cause Only	County-level incident kidney failure cases where primary cause was not diabetes or hypertension	County-level adult population
Stratified Analyses	**Numerator**	**Denominator**
Age		
Age 18-44 Only	County-level incident kidney failure cases among adults age 18-44	County-level population age 18-44
Age 45-64 Only	County-level incident kidney failure cases among adults age 45-64	County-level population age 45-64
Age 65-74 Only	County-level incident kidney failure cases among adults age 65-74	County-level population age 65-74
Age 75+ Only	County-level incident kidney failure cases among adults age 75+	County-level population age 75+
Sex		
Men	County-level incident kidney failure cases among adult men	County-level adult male population
Women	County-level incident kidney failure cases among adult women	County-level adult female population
Race or Ethnicity		
White, non-Hispanic Only	County-level incident kidney failure cases among White, non-Hispanic adults	County-level White, non-Hispanic adult population
Black, non-Hispanic Only	County-level incident kidney failure cases among Black, non-Hispanic adults	County-level Black, non-Hispanic adult population
Hispanic or Latino Only	County-level incident kidney failure cases among Hispanic or Latino adults	County-level Hispanic or Latino adult population
Treatment Modality		
Excluding preemptive kidney transplants	County-level incident kidney failure cases where maintenance dialysis was initiated	County-level adult population

Appendix Exhibit 5A. County-Level Characteristics of US Adult Population Age 18 and Older, 2000-2017

Characteristic, Mean(SD)	Period 1 (2000-2005)	Period 2 (2006-2011)	Period 3 (2012-2017)	p-value
Number of counties	3,134	3,139	3,141	-
Total annual population	68,855 (221,137)	73,684 (233,942)	78,289 (250,323)	-
Age Category, %				
18-44	47.2 (7.1)	43.7 (7.2)	41.8 (7.0)	
45-64	33.1 (3.6)	36.0 (3.7)	35.4 (3.2)	<0.01
65-74	10.2 (2.4)	10.7 (2.5)	12.9 (2.9)	<0.01
75 or older	9.5 (3.1)	9.6 (3.0)	9.9 (2.8)	<0.01
Female, %	50.9 (2.6)	50.6 (2.7)	50.3 (2.8)	<0.01
Race/Ethnicity, %				
White, non-Hispanic	83.0 (18.1)	82.1 (19.0)	79.8 (19.2)	<0.01
Black, non-Hispanic	8.4 (13.7)	8.7 (14.0)	9.0 (14.0)	<0.01
Hispanic or Latino	6.0 (11.6)	7.0 (12.3)	7.9 (12.7)	<0.01
American Indian, non-Hispanic	1.7 (6.7)	1.8 (6.9)	1.9 (7.2)	<0.01
Asian or Pacific Islander, non-Hispanic	1.0 (2.9)	1.3 (3.1)	1.5 (3.3)	<0.01
Percent below the poverty level, %	13.9 (5.6)	16.0 (6.3)	16.5 (6.4)	<0.01
Unemployment rate, %	5.4 (1.9)	7.1 (3.2)	6.1 (2.5)	<0.01
Uninsurance rate, %	18.0 (6.1)	18.1 (5.8)	14.0 (5.9)	<0.01
High school graduate, %	34.7 (6.6)	34.6 (6.8)	34.4 (7.1)	<0.01
Urban/rural designation, %				
Counties in metropolitan areas of 1 million population or more	13.2 (33.9)	13.3 (34.0)	13.8 (34.4)	0.12
Counties in metropolitan areas of 250,000 to 1 million population	10.4 (30.5)	10.6 (30.8)	12.0 (32.5)	<0.01
Counties in metropolitan areas of fewer than 250,000 population	11.2 (31.5)	11.2 (31.5)	11.3 (31.7)	0.67
Urban population of 20,000-49,999	10.3 (30.4)	10.3 (30.4)	9.7 (30.0)	0.07
Urban population of 2,500-19,999	33.7 (47.3)	33.7 (47.3)	32.7 (46.9)	0.03
Completely rural or less than 2,500 urban population	21.3 (40.9)	21.3 (40.9)	20.5 (40.4)	0.07
Diagnosed diabetes, %	8.0 (1.8)	9.8 (2.0)	10.1 (2.9)	<0.01
Number of dialysis facilities per county (n)	1.3 (3.9)	1.6 (4.8)	1.9 (5.9)	<0.01
Number of active physicians per 1,000 persons	1.2 (1.4)	1.2 (1.5)	1.2 (1.6)	0.80

Note: Some group percentages may exceed 100% because of rounding.

Appendix Exhibit 6A. Cause-Specific Kidney Failure Incidence Analyses

	Period 1 (2000-2005)	Period 2 (2006-2011)	Period 3 (2012-2017)	Adjusted Change in Disparity from Period 3 to Period 1 (95%CI)*	P-Value
Main Model					
Highest Quintile of Poverty	494.0	501.9	532.6	38.6 (12.3, 64.8)	<0.01
Lowest Quintile of Poverty	451.2	435.2	432.5	-18.7 (-29.3, -8.1)	
Difference between High and Low Poverty	42.8	66.6	100.1	57.3 (30.2 84.4)	
Diabetes or Hypertension Only					
High Poverty	371.0	399.3	416.8	45.8 (23.8, 67.9)	<0.01
Low Poverty	311.4	307.7	304.9	-6.5 (-15.9, 2.9)	
Difference between High and Low Poverty	59.6	91.6	111.9	52.3 (31.2, 73.4)	
Diabetes Only					
High Poverty	246.9	265.9	268.0	21.0 (2.5, 39.6)	<0.01
Low Poverty	193.4	186.4	184.3	-9.1 (-15.3, -2.9)	
Difference between High and Low Poverty	53.5	79.5	83.6	30.1 (12.5, 47.8)	
Hypertension Only					
High Poverty	124.1	133.4	148.8	24.8 (15.1, 34.4)	<0.01
Low Poverty	118.0	121.2	120.6	2.6 (-3.6, 8.9)	
Difference between High and Low Poverty	6.1	12.2	28.2	22.2 (12.2, 32.2)	
Other Primary Cause Only					
High Poverty	142.1	145.2	133.8	-8.3 (-17.8, 1.3)	0.86
Low Poverty	121.5	123.7	114.1	-7.3 (-11.8, -2.8)	
Difference between High and Low Poverty	20.6	21.5	19.7	-0.9 (-11.4, 9.5)	

Note. * Estimates reflect change in kidney failure incidence per million over time between low- and high-poverty counties. Models include indicators for poverty quintile, period, and their interaction (poverty quintile*period), as well as age, sex, county-level proportions of the population that are Black, Hispanic/Latino, Asian, or American Indian/Native American, county-level sociodemographic characteristics (e.g., urban/rural designation, uninsurance rate, unemployment rate, and educational attainment, county-level number of dialysis facilities per capita and number of active non-federal physicians per 1,000 population. All models are weighted by the county's adult population. Standard errors are clustered at the county level. Kidney failure due to diabetes was defined using ICD-9 codes 250.40 and 250.41 and ICD-10 codes E10.22, E10.29, E11.22, and E11.29). Incident patients with kidney failure due to hypertension was defined using ICD-9 code 40391 and ICD-10 code I12.9.

Appendix Exhibit 7A. Stratified Analyses, by Sex

	Period 1 (2000-2005)	Period 2 (2006-2011)	Period 3 (2012-2017)	Adjusted Change in Disparity from Period 3 to Period 1 (95%CI)*	P-Value
Main Model					
Highest Quintile of Poverty	494.0	501.9	532.6	38.6 (12.3, 64.8)	<0.01
Lowest Quintile of Poverty	451.2	435.2	432.5	-18.7 (-29.3, -8.1)	
Difference between High and Low Poverty	42.8	66.6	100.1	57.3 (30.2 84.4)	
Men Only					
High Poverty	556.6	583.8	610.5	53.9 (24.7, 83.1)	<0.01
Low Poverty	525.6	510.0	503.5	-22.1 (-35.5, -8.7)	
Difference between High and Low Poverty	31.0	73.8	107.0	76.0 (45.3, 106.7)	
Women Only					
High Poverty	433.9	426.6	460.3	26.3 (0.1, 52.6)	<0.01
Low Poverty	379.6	364.4	364.8	-14.8 (-25.7, -3.9)	
Difference between High and Low Poverty	54.3	62.2	95.5	41.1 (14.9, 67.4)	

Note. * Estimates reflect change in kidney failure incidence per million over time between low- and high-poverty counties. Models include indicators for poverty quintile, period, and their interaction (poverty quintile*period), as well as age, county-level proportions of the population that are Black, Hispanic/Latino, Asian, or American Indian/Native American, county-level sociodemographic characteristics (e.g., urban/rural designation, uninsurance rate, unemployment rate, and educational attainment, county-level prevalence of diagnosed diabetes, county-level number of dialysis facilities per capita and number of active non-federal physicians per 1,000 population. All models are weighted by the county's adult population. Standard errors are clustered at the county level.

Appendix Exhibit 8A. Stratified Analyses, by Age Group

	Period 1 (2000-2005)	Period 2 (2006-2011)	Period 3 (2012-2017)	Adjusted Change in Disparity from Period 3 to Period 1 (95%CI)*	P-Value
Main Model					
Highest Quintile of Poverty	494.0	501.9	532.6	38.6 (12.3, 64.8)	<0.01
Lowest Quintile of Poverty	451.2	435.2	432.5	-18.7 (-29.3, -8.1)	
Difference between High and Low Poverty	42.8	66.6	100.1	57.3 (30.2 84.4)	
Age 18-44 Only					
High Poverty	122.9	121.8	131.6	8.7 (-2.7, 20.2)	0.20
Low Poverty	112.5	108.0	113.3	0.8 (-4.0, 5.6)	
Difference between High and Low Poverty	10.3	13.8	18.3	7.9 (-4.3, 20.1)	
Age 45-64 Only					
High Poverty	626.2	611.4	667.6	41.4 (-1.2, 84.0)	0.10
Low Poverty	478.2	460.0	483.7	5.5 (-9.4, 20.4)	
Difference between High and Low Poverty	148.0	151.4	183.8	35.8 (-6.8, 78.5)	
Age 65-74 Only					
High Poverty	1273.4	1285.6	1298.7	25.3 (-47.8, 98.3)	0.07
Low Poverty	1199.8	1152.2	1155.4	-44.4 (-81.5, -7.3)	
Difference between High and Low Poverty	73.6	133.5	143.3	69.7 (-6.1, 145.4)	
Age 75+ Only					
High Poverty	1414.8	1467.0	1432.8	18.0 (-64.7, 100.7)	0.02
Low Poverty	1485.3	1506.7	1397.2	-88.1 (-139.8, -36.4)	
Difference between High and Low Poverty	-70.5	-39.7	35.6	106.1 (16.8, 195.5)	

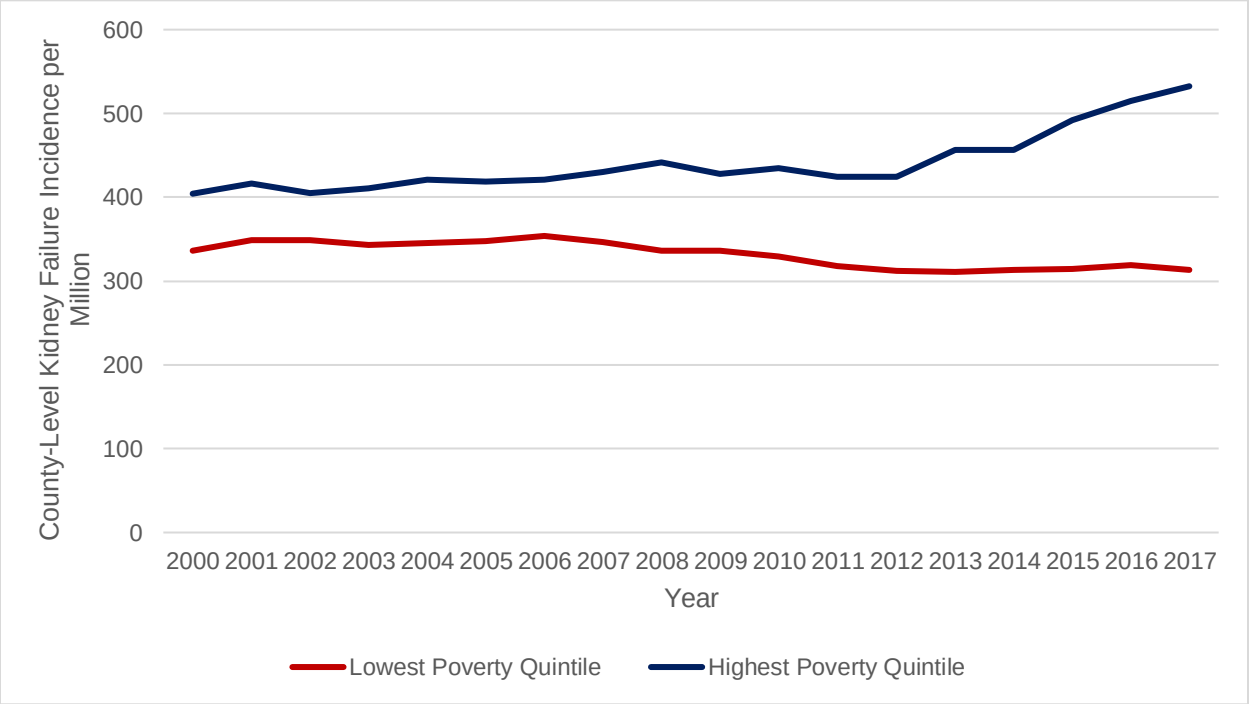
Note. * Estimates reflect change in kidney failure incidence per million over time between low- and high-poverty counties. Models include indicators for poverty quintile, period, and their interaction (poverty quintile*period), as well as sex, county-level proportions of the population that are Black, Hispanic/Latino, Asian, or American Indian/Native American, county-level sociodemographic characteristics (e.g., urban/rural designation, uninsurance rate, unemployment rate, and educational attainment, county-level prevalence of diagnosed diabetes, county-level number of dialysis facilities per capita and number of active non-federal physicians per 1,000 population. All models are weighted by the county's adult population. Standard errors are clustered at the county level.

Appendix Exhibit 9A. Stratified Analyses, by Race or Ethnicity

	Period 1 (2000-2005)	Period 2 (2006-2011)	Period 3 (2012-2017)	Adjusted Change in Disparity from Period 3 to Period 1 (95%CI)*	P-Value
Main Model					
Highest Quintile of Poverty	494.0	501.9	532.6	38.6 (12.3, 64.8)	<0.01
Lowest Quintile of Poverty	451.2	435.2	432.5	-18.7 (-29.3, -8.1)	
Difference between High and Low Poverty	42.8	66.6	100.1	57.3 (30.2 84.4)	
White, Non-Hispanic Only					
High Poverty	398.3	389.9	431.9	33.6 (13.5, 53.8)	<0.01
Low Poverty	363.5	344.7	333.8	-29.7 (-25.4, -12.2)	
Difference between High and Low Poverty	34.8	45.2	98.2	63.3 (43.4, 83.3)	
Black, Non-Hispanic Only					
High Poverty	1058.9	1060.9	1072.6	13.7 (-35.4, 62.9)	0.23
Low Poverty	1006.7	1024.5	982.2	-24.5 (-68.0, 19.0)	
Difference between High and Low Poverty	52.2	36.4	90.4	38.2 (-23.4, 99.8)	
Hispanic or Latino					
High Poverty	438.9	484.4	517.4	78.5 (-8.8, 165.8)	0.02
Low Poverty	393.2	377.9	360.1	-33.1 (-63.5, -2.8)	
Difference between High and Low Poverty	45.7	106.5	157.3	111.6 (20.2, 203.2)	

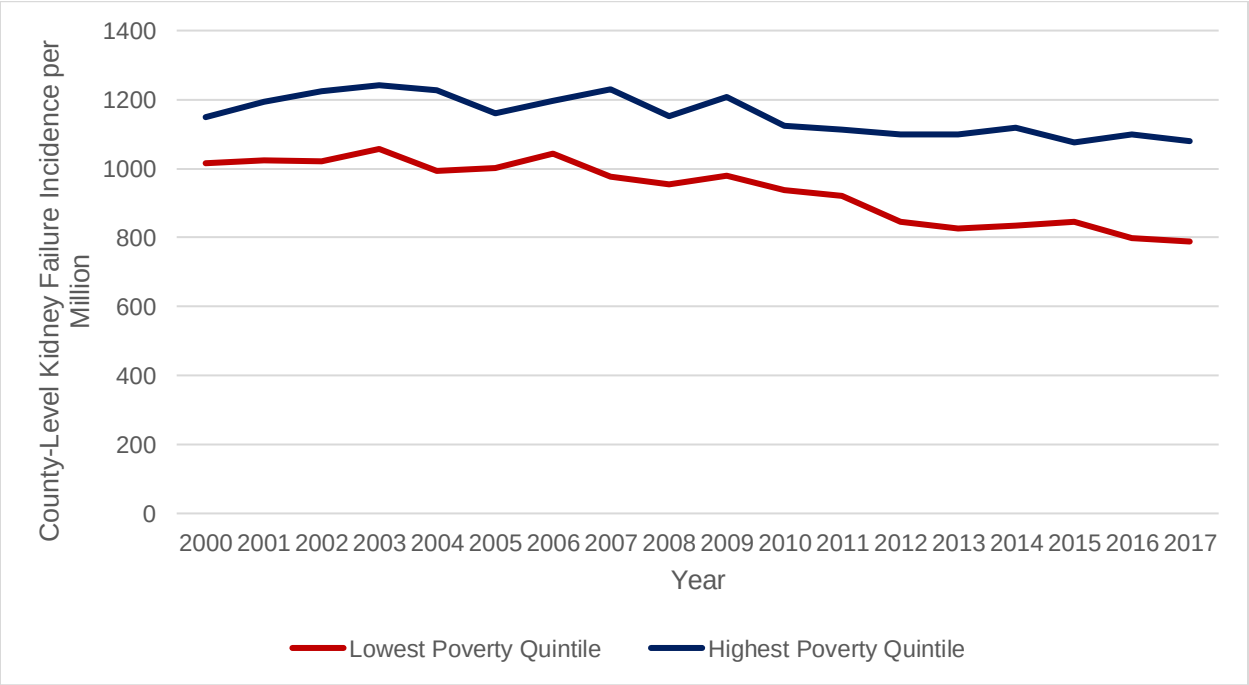
Note. * Estimates reflect change in kidney failure incidence per million over time between low- and high-poverty counties. Models include indicators for poverty quintile, period, and their interaction (poverty quintile*period), as well as age, sex, county-level sociodemographic characteristics (e.g., urban/rural designation, uninsurance rate, unemployment rate, and educational attainment, county-level prevalence of diagnosed diabetes, county-level number of dialysis facilities per capita, and number of active non-federal physicians per 1,000 population. All models are weighted by the county's adult population for each race or ethnicity. Standard errors are clustered at the county level.

Appendix Exhibit 10A. County-Level Kidney Failure Incidence per Million by Poverty Level among White, non-Hispanic Patients, 2000-2017



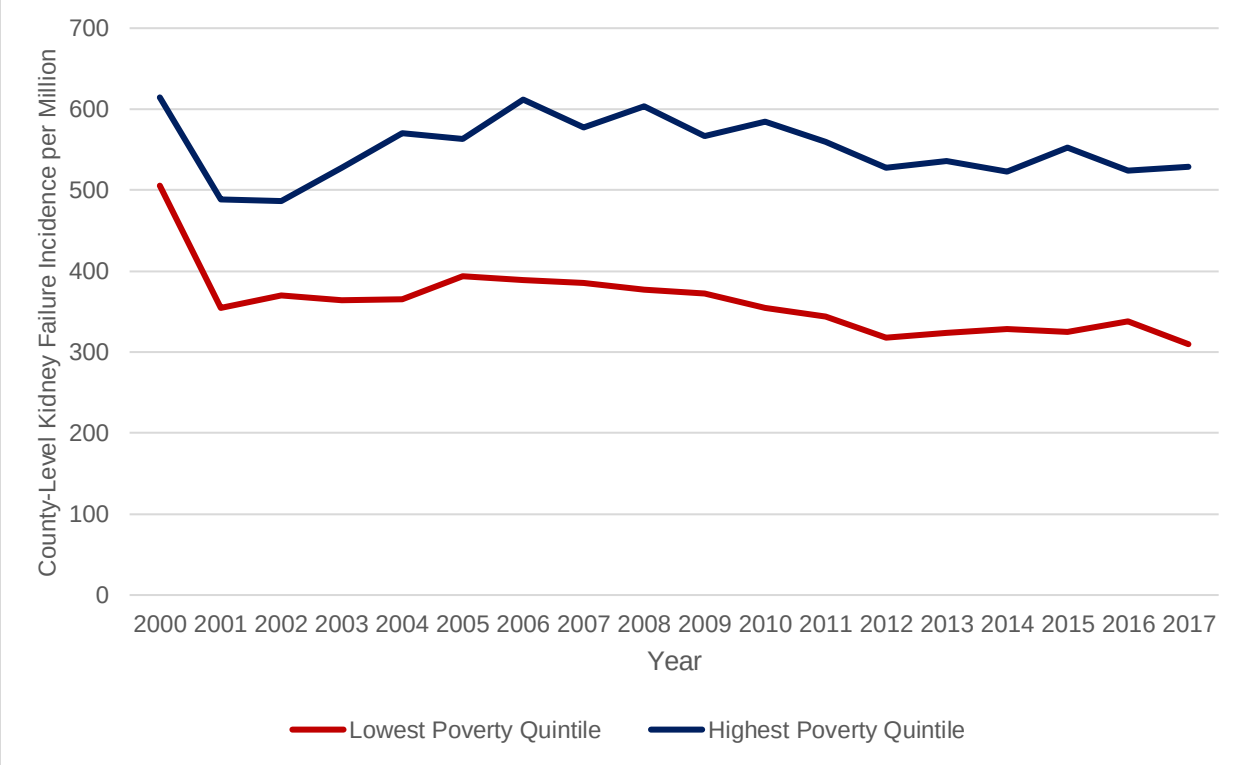
Note. Estimates are age-sex adjusted.

Appendix Exhibit 11A. County-Level Kidney Failure Incidence per Million by Poverty Level among Black, non-Hispanic Patients, 2000-2017



Note. Estimates are age-sex adjusted.

Appendix Exhibit 12A. County-Level Kidney Failure Incidence per Million by Poverty Level among Hispanic or Latino Patients, 2000-2017



Note. Estimates are age-sex adjusted.

Appendix Exhibit 13A. Stratified Analyses, by Treatment Modality

	Period 1 (2000-2005)	Period 2 (2006-2011)	Period 3 (2012-2017)	Adjusted Change in Disparity from Period 3 to Period 1 (95%CI)*	P-Value
Main Model					
Highest Quintile of Poverty	494.0	501.9	532.6	38.6 (12.3, 64.8)	<0.01
Lowest Quintile of Poverty	451.2	435.2	432.5	-18.7 (-29.3, -8.1)	
Difference between High and Low Poverty	42.8	66.6	100.1	57.3 (30.2 84.4)	
Excluding preemptive kidney transplants					
High Poverty	488.2	492.3	524.4	36.2 (10.2, 62.1)	<0.01
Low Poverty	441.6	422.7	421.8	-19.9 (-30.4, -9.3)	
Difference between High and Low Poverty	46.5	69.6	102.6	56.1 (29.2, 82.9)	

Note. * Coefficients reflect change in kidney failure incidence per million over time between low- and high-poverty counties. Models include indicators for poverty quintile, period, and their interaction (poverty quintile*period), as well as age, sex, county-level proportions of the population that are Black, Hispanic/Latino, Asian, or American Indian/Native American, county-level sociodemographic characteristics (e.g., urban/rural designation, uninsurance rate, unemployment rate, and educational attainment, county-level prevalence of diagnosed diabetes, county-level number of dialysis facilities per capita and number of active non-federal physicians per 1,000 population. All models are weighted by the county's adult population. Standard errors are clustered at the county level.

Appendix Exhibit 14A. Alternative Model Specifications and Exposure Definitions

	Adjusted Change in Disparity from Period 3 to Period 1 (95%CI)*	P-Value
Main Model	57.3 (30.2, 84.4)	<0.01
Alternative Exposure Definitions		
Proportion of Households Living Below Poverty	3.8 (2.7, 5.0)	<0.01
Poverty Quintile Fixed in 2000	60.3 (36.6, 83.9)	<0.01
Poverty Quintile Assigned by Period, Rather than Annually	69.9 (33.1, 100.7)	<0.01
Alternative Model Specifications		
Main Model, adding county-level median income as covariate	71.8 (46.5, 97.1)	<0.01
Included county fixed effects	35.2 (16.8, 55.6)	<0.01
Included county and year fixed effects	37.2 (18.7, 55.7)	<0.01

Notes. * Estimates reflect change in kidney failure incidence per million over time between low- and high-poverty counties. Models include indicators for poverty quintile, period, and their interaction (poverty quintile*period), as well as age, sex, county-level proportions of the population that are Black, Hispanic/Latino, Asian, or American Indian/Native American, county-level sociodemographic characteristics (e.g., urban/rural designation, uninsurance rate, unemployment rate, and educational attainment, county-level prevalence of diagnosed diabetes, county-level number of dialysis facilities per capita and number of active non-federal physicians per 1,000 population. All models are weighted by the county's adult population. Standard errors are clustered at the county level.

Appendix Exhibit 15A. Alternative Model Specifications for Time Period

	Period 1 (2000-2005)	Period 2 (2006-2011)	Period 3 (2012-2017)	Adjusted Change in Disparity from Period 3 to Period 1 (95%CI)*	P-Value
Main Model: Comparing Period 3 to Period 1					
Highest Quintile of Poverty	494.0	501.9	532.6	38.6 (12.3, 64.8)	<0.01
Lowest Quintile of Poverty	451.2	435.2	432.5	-18.7 (-29.3, -8.1)	
Difference between High and Low Poverty	42.8	66.6	100.1	57.3 (30.2, 84.4)	

	Period 1 (2000-2005)	Period 2 (2006-2011)	Period 3 (2012-2017)	Adjusted Change in Disparity from Period 3 to Period 2 (95%CI)*	P-Value
Alternative Specification: Comparing Period 3 to Period 2					
High Poverty	494.0	501.9	532.6	30.7 (16.4, 45.0)	<0.01
Low Poverty	451.2	435.2	432.5	-2.8 (-11.8, 6.2)	
Difference between High and Low Poverty	42.8	66.6	100.1	33.5 (17.4, 49.5)	

	Period 1 (2000-2005)	Period 2 (2006-2011)	Period 3 (2012-2017)	Adjusted Change in Disparity from Period 2 to Period 1 (95%CI)*	P-Value
Alternative Specification: Comparing Period 2 to Period 1					
High Poverty	494.0	501.9	532.6	7.9 (-13.2, 29.0)	0.03
Low Poverty	451.2	435.2	432.5	-15.9 (-22.9, 8.9)	
Difference between High and Low Poverty	42.8	66.6	100.1	23.8 (2.0, 45.6)	

Note: * Estimates reflect change in kidney failure incidence per million over time between low- and high-poverty counties. Models include indicators for poverty quintile, period, and their interaction (poverty quintile*period), as well as age, sex, county-level proportions of the population that are Black, Hispanic/Latino, Asian, or American Indian/Native American, county-level sociodemographic characteristics (e.g., urban/rural designation, uninsurance rate, unemployment rate, and educational attainment, county-level prevalence of diagnosed diabetes, county-level number of dialysis facilities per capita and number of active non-federal physicians per 1,000 population. All models are weighted by the county's adult population. Standard errors are clustered at the county level.

Appendix Exhibit 16A. Three-Way Interactions for Age

	Period 1 (2000-2005)	Period 2 (2006-2011)	Period 3 (2012-2017)	P-Value
Main Model				
Highest Quintile of Poverty	494.0	501.9	532.6	<0.01
Lowest Quintile of Poverty	451.2	435.2	432.5	
Difference between High and Low Poverty	42.8	66.6	100.1	
Age (Age 18-64 vs. 65 and older)				
Age 18-64				
Highest Quintile of Poverty	250.2	262.5	301.4	Ref
Lowest Quintile of Poverty	269.4	265.2	294.0	
Difference between High and Low Poverty	-19.1	-2.7	7.4	
Age 65 and older				
Highest Quintile of Poverty	1622.9	1593.3	1519.2	0.02
Lowest Quintile of Poverty	1328.0	1300.6	1152.0	
Difference between High and Low Poverty	292.9	292.7	367.2	

Note: Estimates presented are marginal effects. Models with three-way interaction for age group include an indicator for poverty quintile, period, age group (18-64 vs. 65 and older), and their interaction (poverty quintile*period*65 or older). All models include indicators for age, sex, county-level proportions of the population that are Black, Hispanic/Latino, Asian, or American Indian/Native American, county-level sociodemographic characteristics (e.g., urban/rural designation, uninsurance rate, unemployment rate, and educational attainment, county-level prevalence of diagnosed diabetes, county-level number of dialysis facilities per capita and number of active non-federal physicians per 1,000 population. All models are weighted by the county's adult population. Standard errors are clustered at the county level.

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