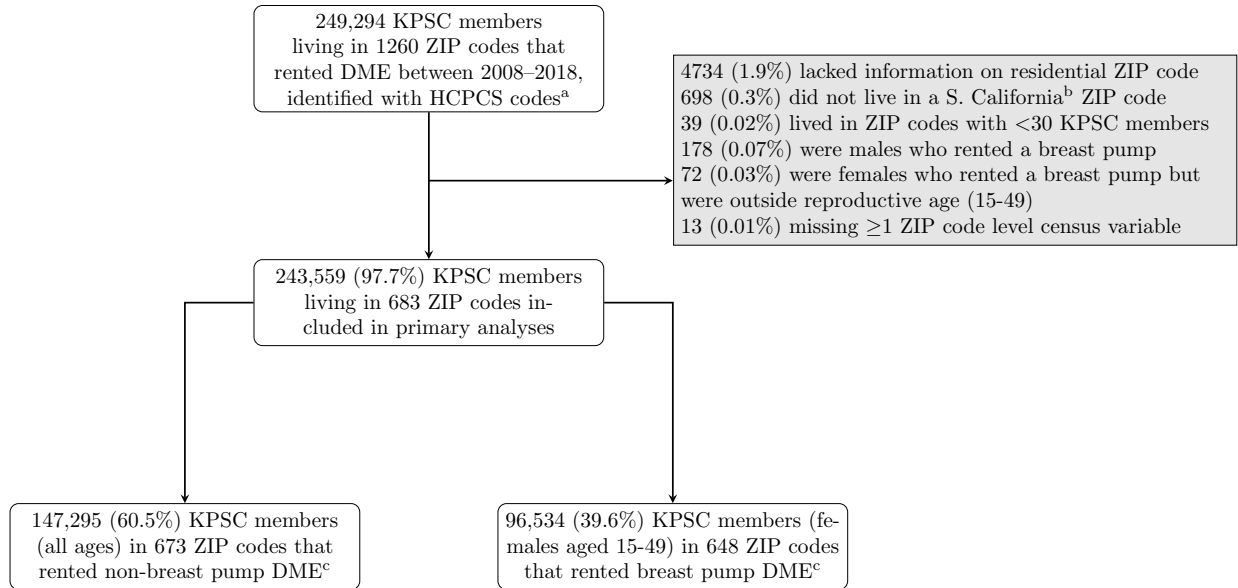


eFigure 1: Study population assembly and exclusions.



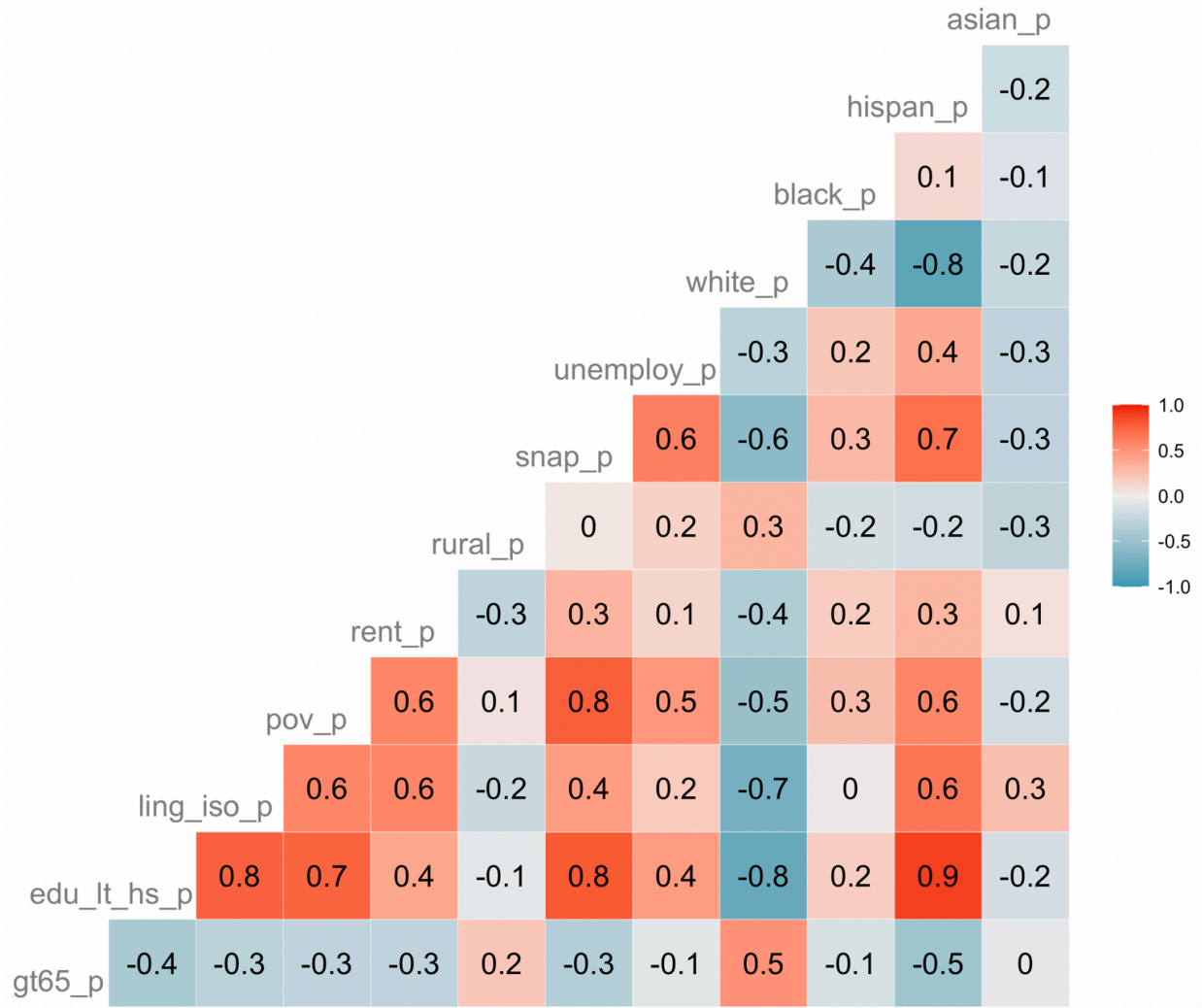
^a See eTable 1

^b ZIP code outside of Imperial, Kern, Los Angeles, Orange, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara, and Ventura counties

^c 270 KPSC members rented both non-breast pump and breast pump DME and are included in both groups
Notes. DME, durable medical equipment; HCPCS Healthcare Common Procedure Coding System, KPSC, Kaiser Permanente Southern California.

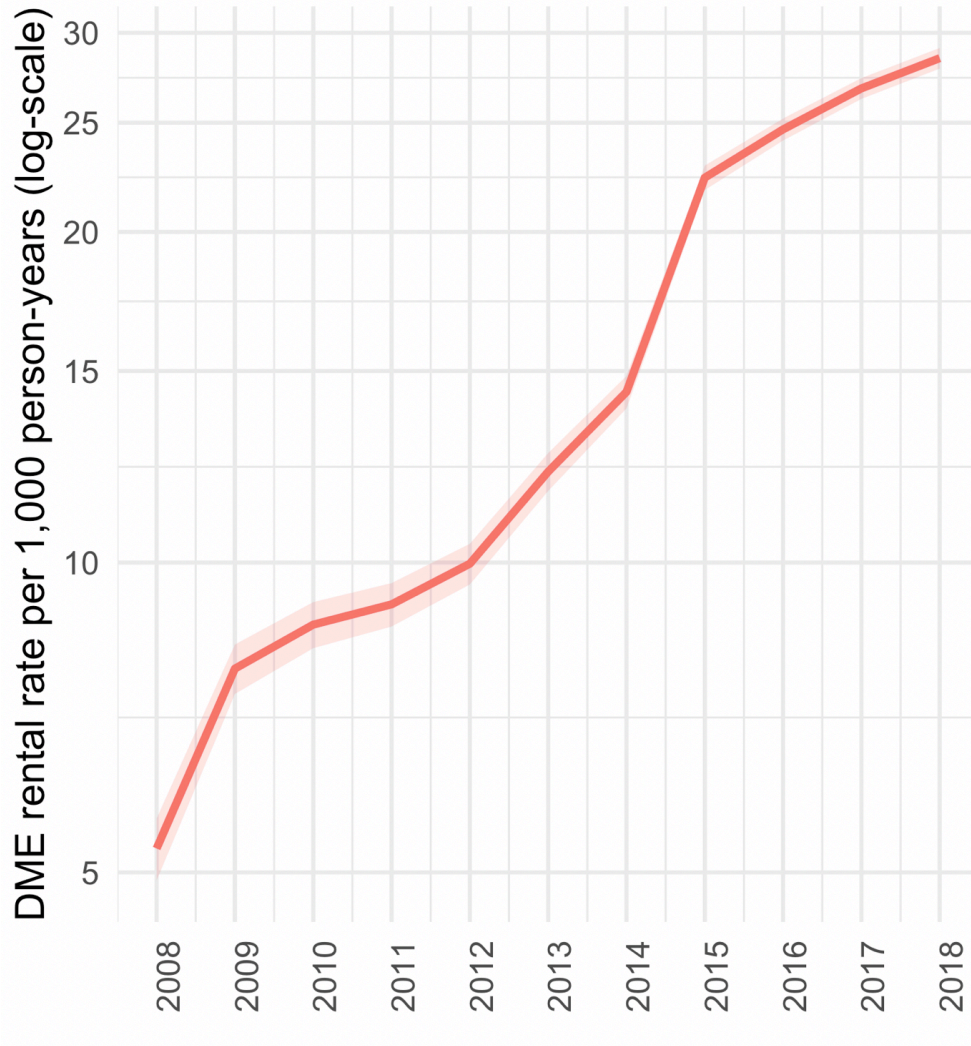
eFigure 2: Spearman correlation matrix for ZIP code-level sociodemographic variables from the 2006–2010 American Community Survey.

asian_p, % non-Hispanic Asian; hispan_p, % Hispanic, black_p, % non-Hispanic Black; white_p, % non-Hispanic White; unemploy_p, % unemployed; snap_p, % using SNAP; rural_p, % rural residents; rent_p, % renters; pov_p, % living below the federal poverty threshold; ling_iso_p, % linguistically isolated; edu_lt_hs_p, % less than a high school education; gt65_p, % greater than 65 years of age.



eFigure 3: Prevalence and 95% CI of electric DME rental per 1,000 person-years among Medicaid recipients aged 18-64 years at Kaiser Permanente Southern California, 2008–2018.

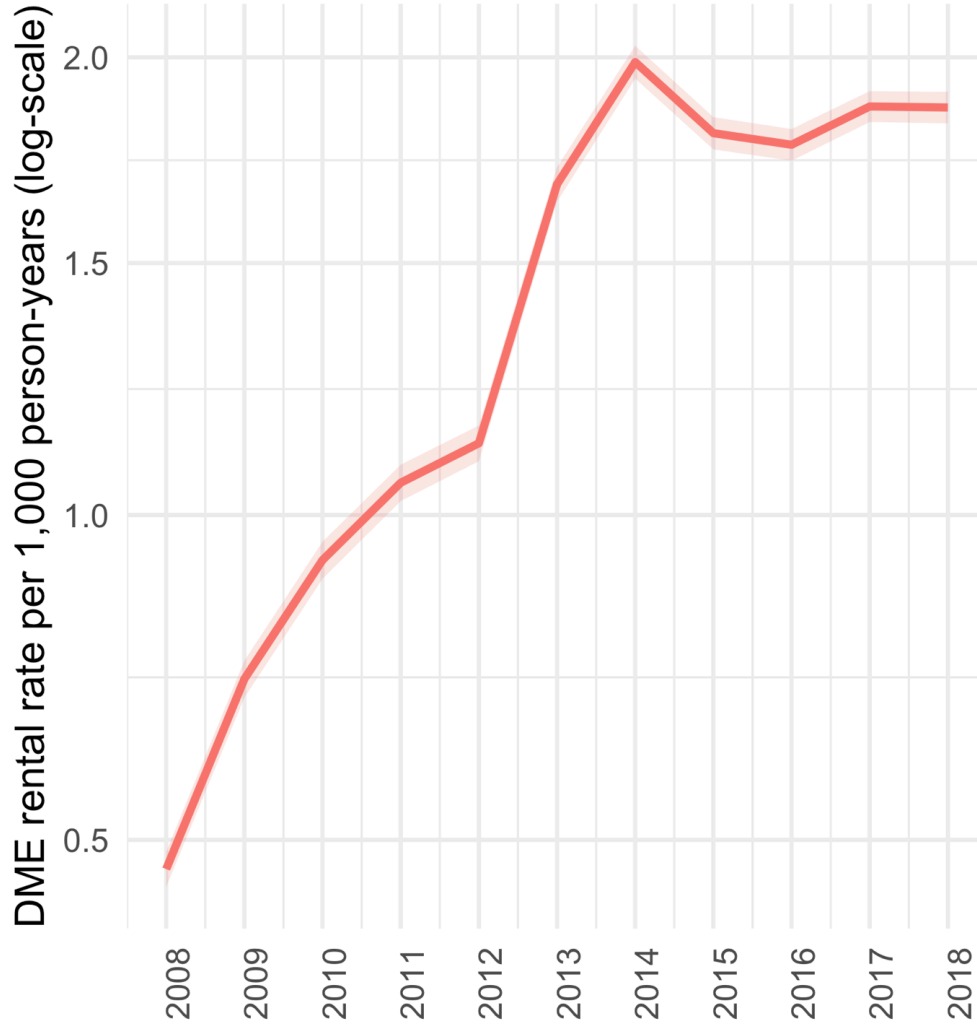
Notes. DME, durable medical equipment.



eFigure 4: Prevalence and 95% CI of rental of two or more categories of electric DME^a per 1,000 person-years at Kaiser Permanente Southern California, 2008–2018.

Notes. DME, durable medical equipment.

^a Includes bilevel Positive Airway Pressure (BiPAP) machines, enteral feeding machines, hospital beds, infusion pumps, oxygen equipment, suction pumps, ventilators, wheelchairs, and breast pumps.

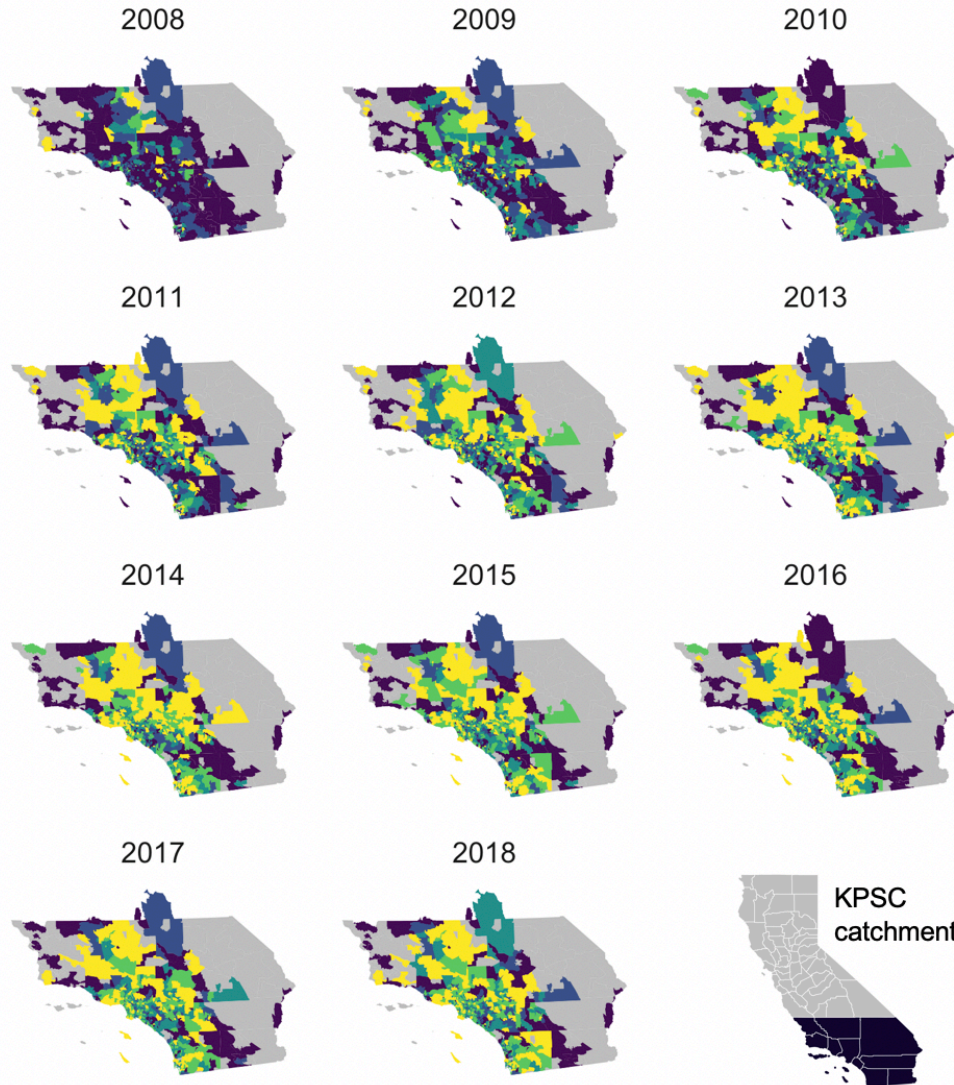


eFigure 5: Annual ZIP code level quintiles of electric DME rental rate per 1,000 person-years at Kaiser Permanente Southern California, 2008–2018 for A) DME^a; and B) breast pumps.

^a Includes all non-breast pump DME rental types: Bilevel Positive Airway Pressure (BiPAP) machines, enteral feeding machines, hospital beds, infusion pumps, oxygen equipment, suction pumps, ventilators, and wheelchairs.

Notes. DME, durable medical equipment

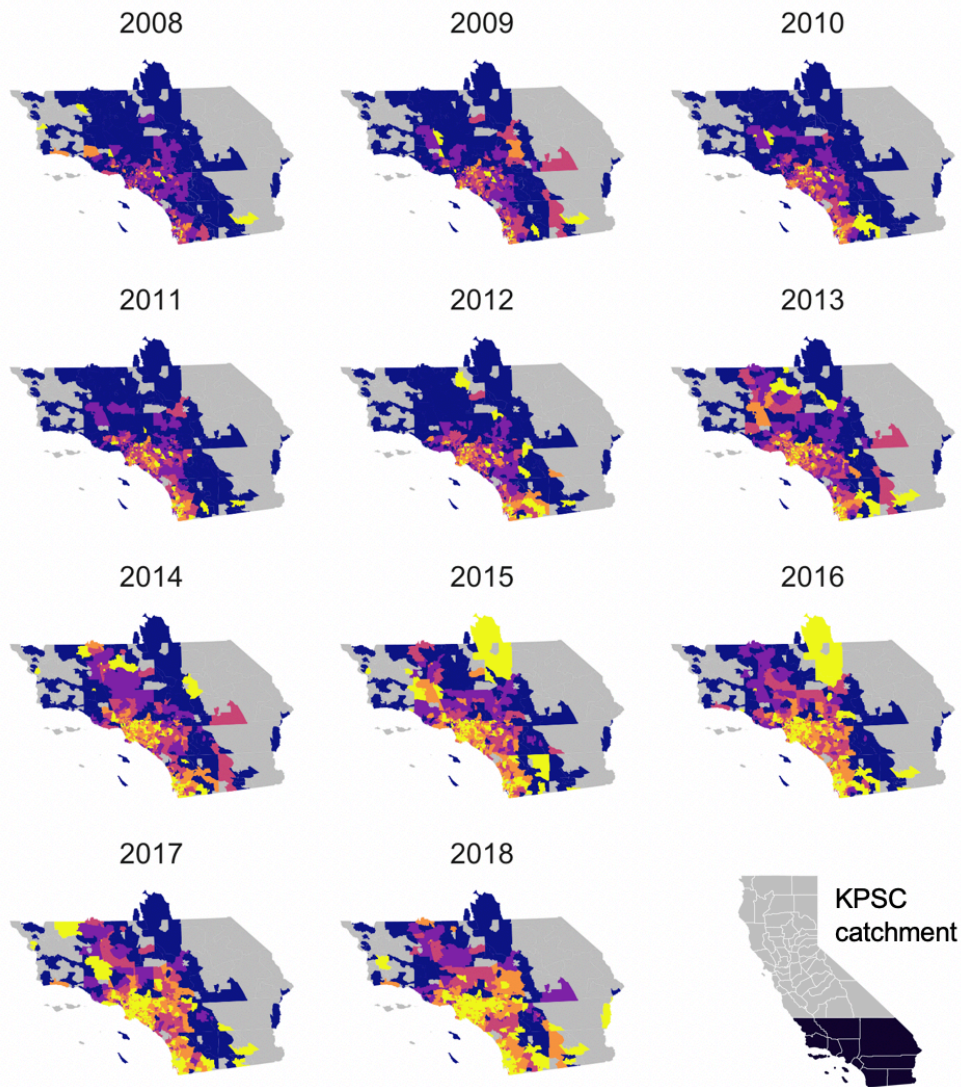
A



DME rental rate per 1,000 person-years

| | | | | | |
|--|-----------|--|------------|--|----------|
| | < 3.9 | | [5.7-7.4) | | > 10.3 |
| | [3.9-5.7) | | [7.4-10.3) | | Excluded |

B



DME rental rate per 1,000 person-years

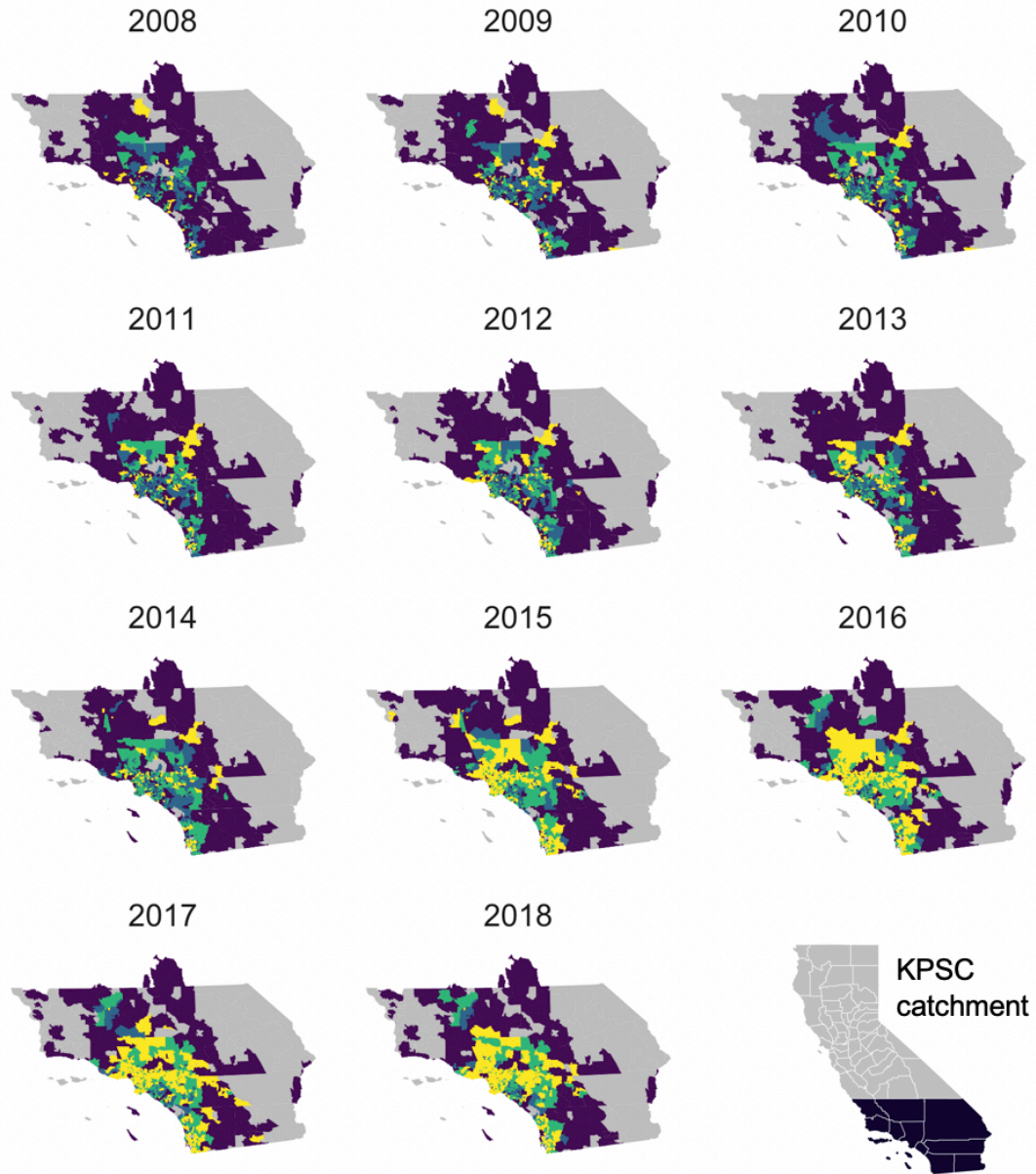
| | | | | | |
|---|-----------|---|-------------|---|----------|
|  | < 3.5 |  | [7.3-11.0) |  | > 16.1 |
|  | [3.5-7.3) |  | [11.0-16.1) |  | Excluded |

eFigure 6: Annual ZIP code level quartiles of electric DME rental rate per 1,000 person-years among Kaiser Permanente Southern California members who used Medicaid as insurance, 2008–2018 for A) DME^a; and B) breast pumps.

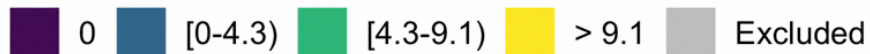
^a Includes all non-breast pump DME rental types: Bilevel Positive Airway Pressure (BiPAP) machines, enteral feeding machines, hospital beds, infusion pumps, oxygen equipment, suction pumps, ventilators, and wheelchairs.

Notes. DME, durable medical equipment

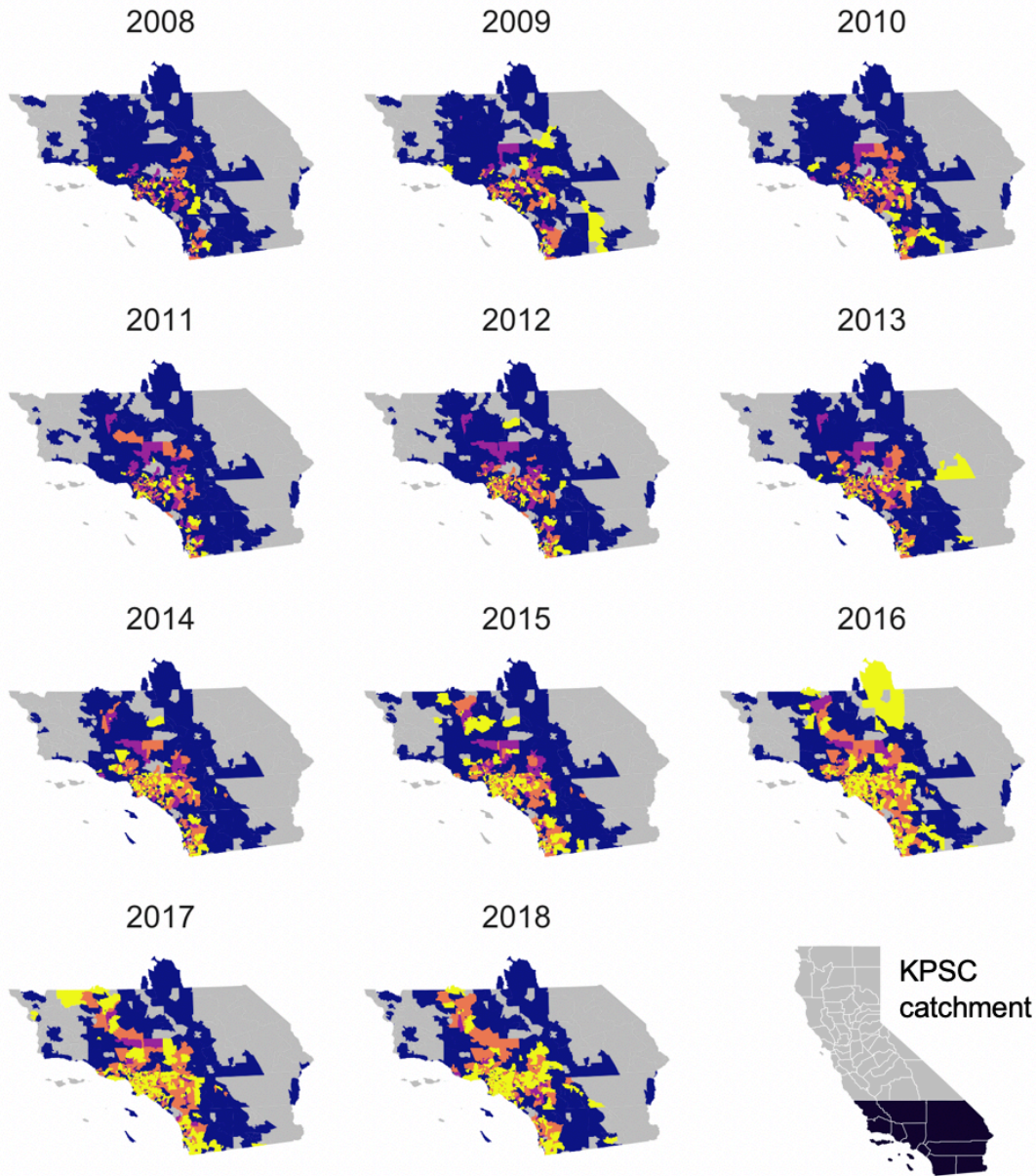
A



DME rental rate per 1,000 person-years



B



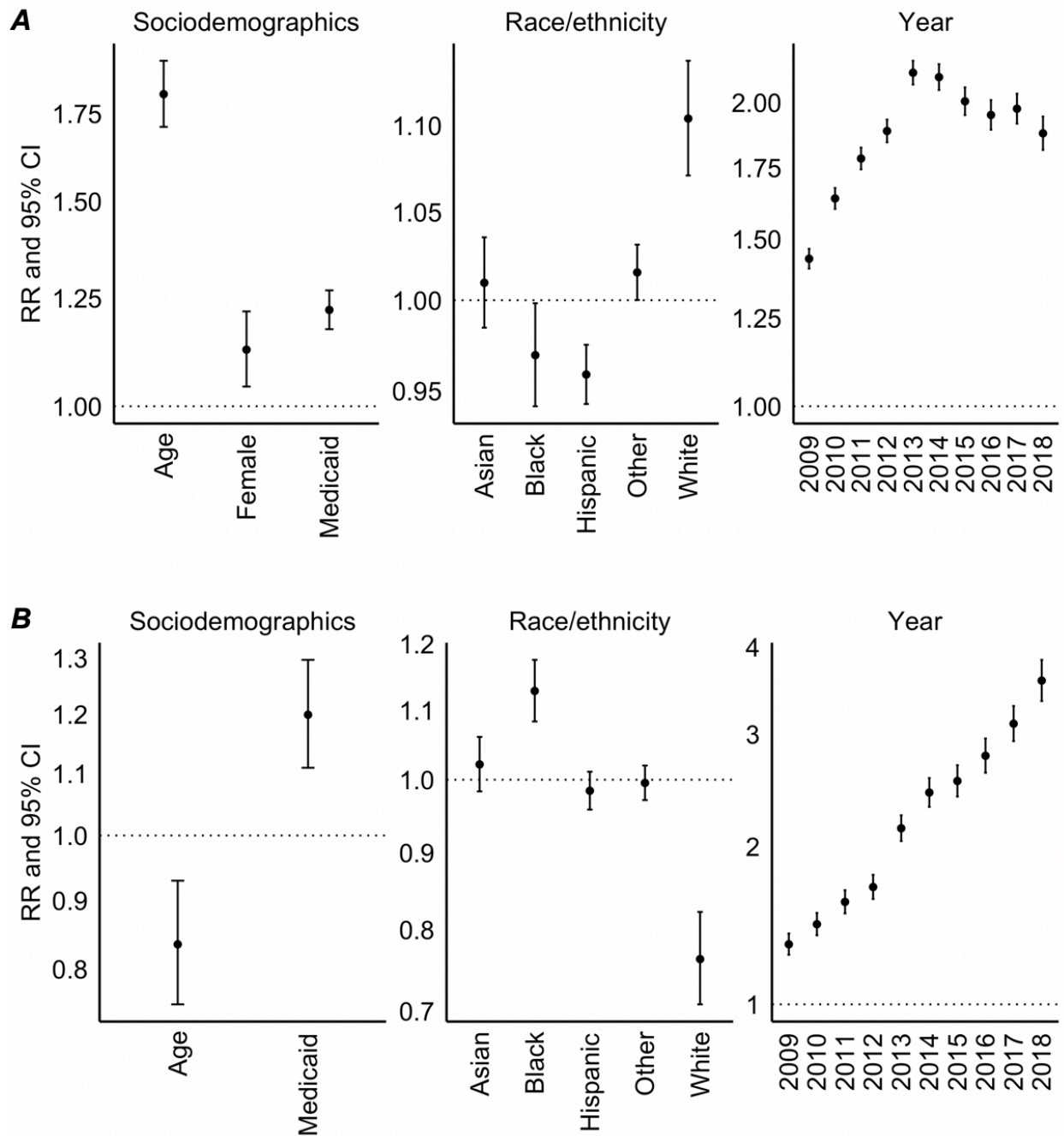
DME rental rate per 1,000 person-years



eFigure 7: ZIP code-level rate ratio for DME rentals by Kaiser Permanente Southern California member sociodemographics, 2008–2018 for A) DME rentals;^a and B) Breast pump rentals.

^aIncludes all non-breast pump DME rental types: Bilevel Positive Airway Pressure (BiPAP) machines, enteral feeding machines, hospital beds, infusion pumps, oxygen equipment, suction pumps, ventilators, and wheelchairs.

Notes. DME, durable medical equipment.



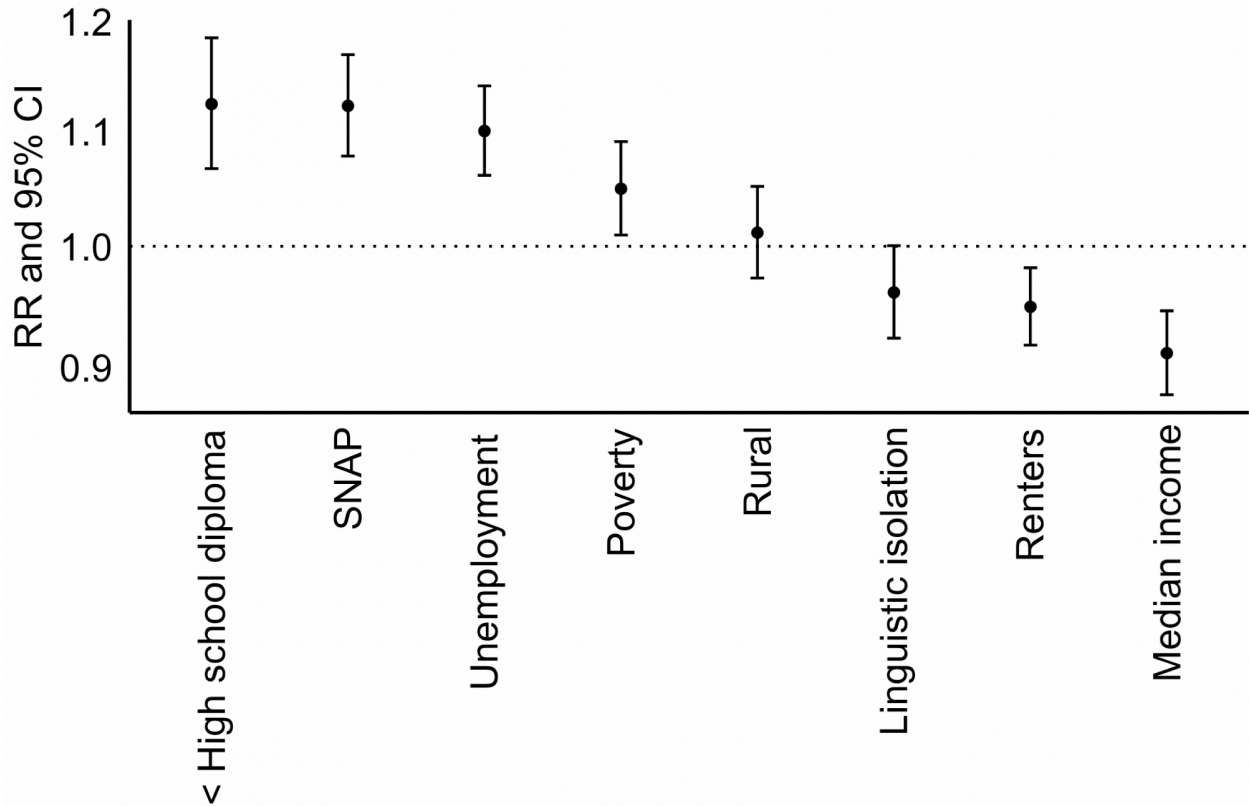
eFigure 8: ZIP code-level rate ratio for DME rentals^a at Kaiser Permanente Southern California, 2008–2018 by ZIP code-level socioeconomic factors in A) SES variables modeled individually; B) Race/ethnicity variables modeled individually.

All models were adjusted for year and descriptors of the ZIP code-level KPSC member population: mean age, percent Medicaid users, percent Hispanic members, percent non-Hispanic Black members, and percent female members.

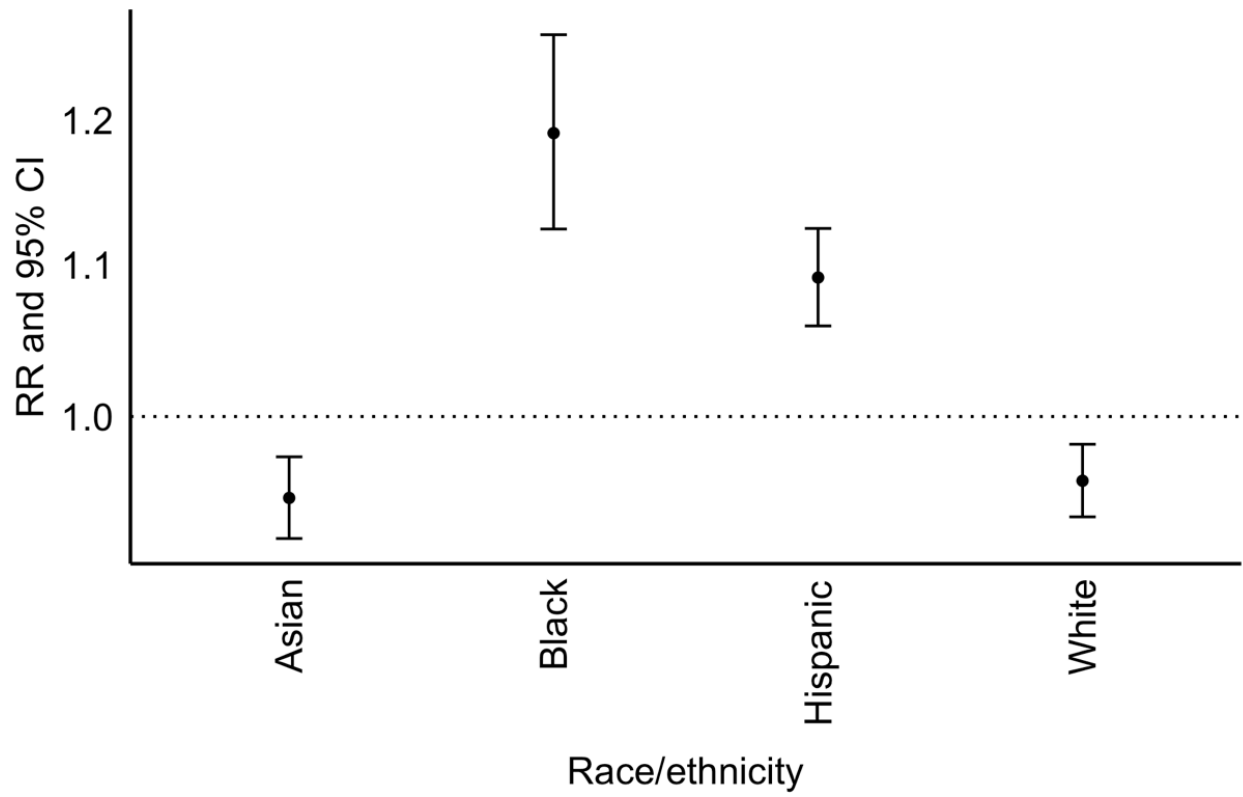
^aIncludes all non-breast pump DME rental types: Bilevel Positive Airway Pressure (BiPAP) machines, enteral feeding machines, hospital beds, infusion pumps, oxygen equipment, suction pumps, ventilators, and wheelchairs.

Notes. DME, durable medical equipment.

A ZIP code-level variables modeled individually



B ZIP code-level race/ethnicity variables modeled individually

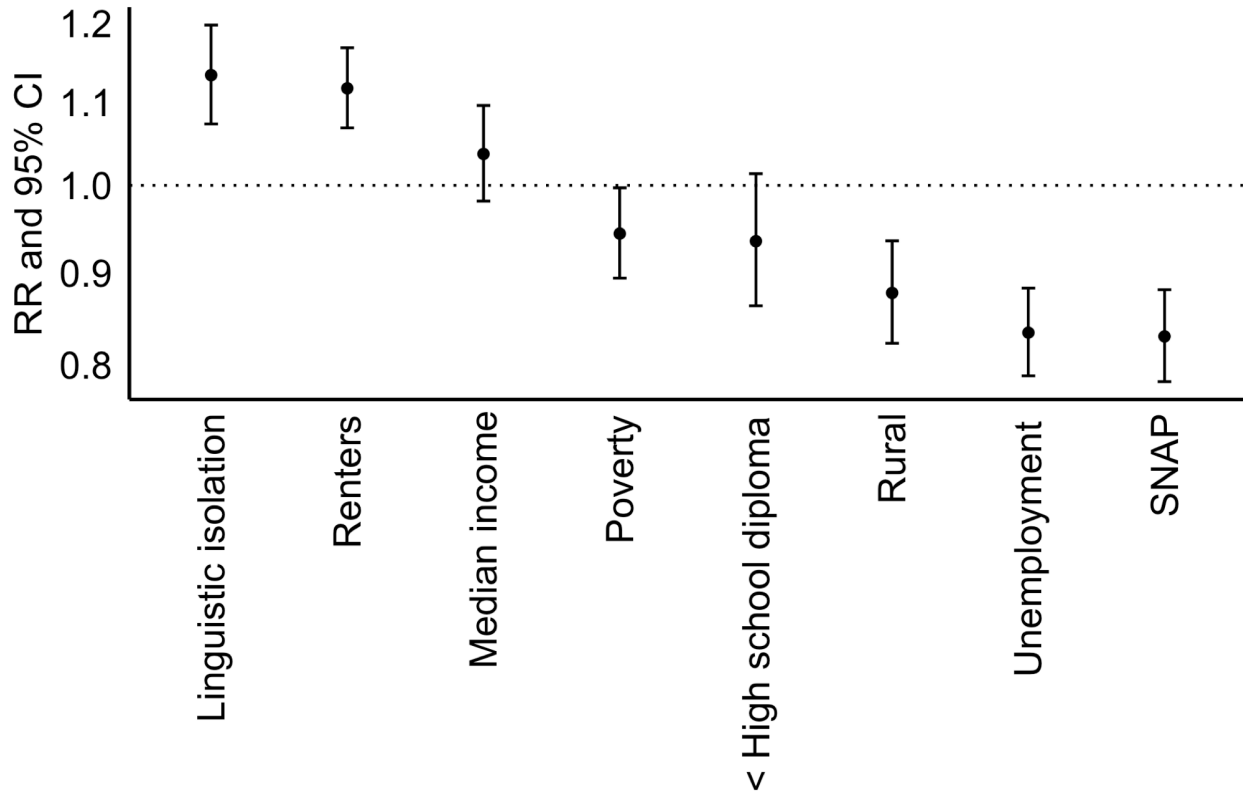


eFigure 9: ZIP code-level rate ratio for breast pump DME rentals at Kaiser Permanente Southern California, 2008–2018 by ZIP code-level sociodemographic factors in A) SES variables modeled individually; B) Race/ethnicity variables modeled individually.

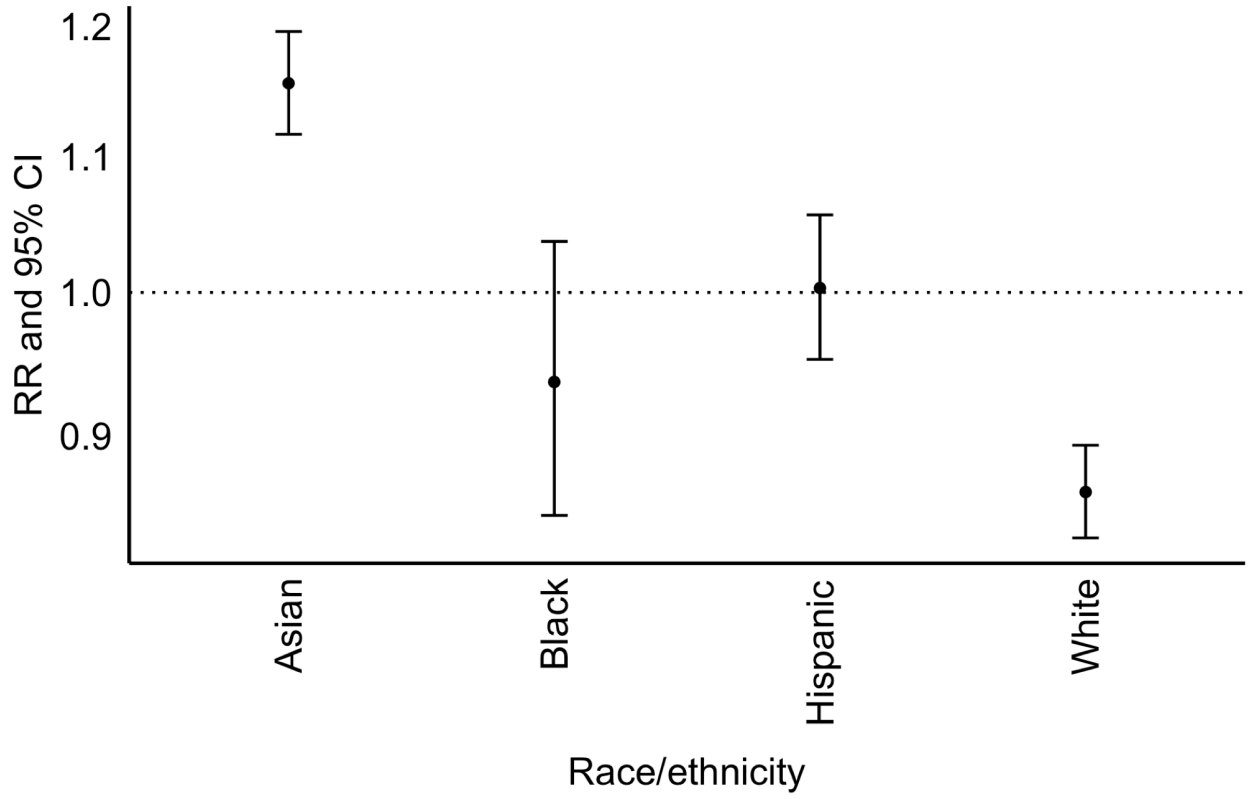
All models were adjusted for year and descriptors of the ZIP code-level KPSC member population: mean age, percent Medicaid users, percent Hispanic members, and percent non-Hispanic Black members.

Notes. DME, durable medical equipment, SES, socioeconomic status.

A ZIP code-level SES variables modeled individually



B ZIP code-level race/ethnicity variables modeled individually



eFigure 10: Duration of cumulative DME rentals by Kaiser Permanente Southern California member characteristics, 2008–2018 for A) DME renters^a; and B) Breast pump renters.

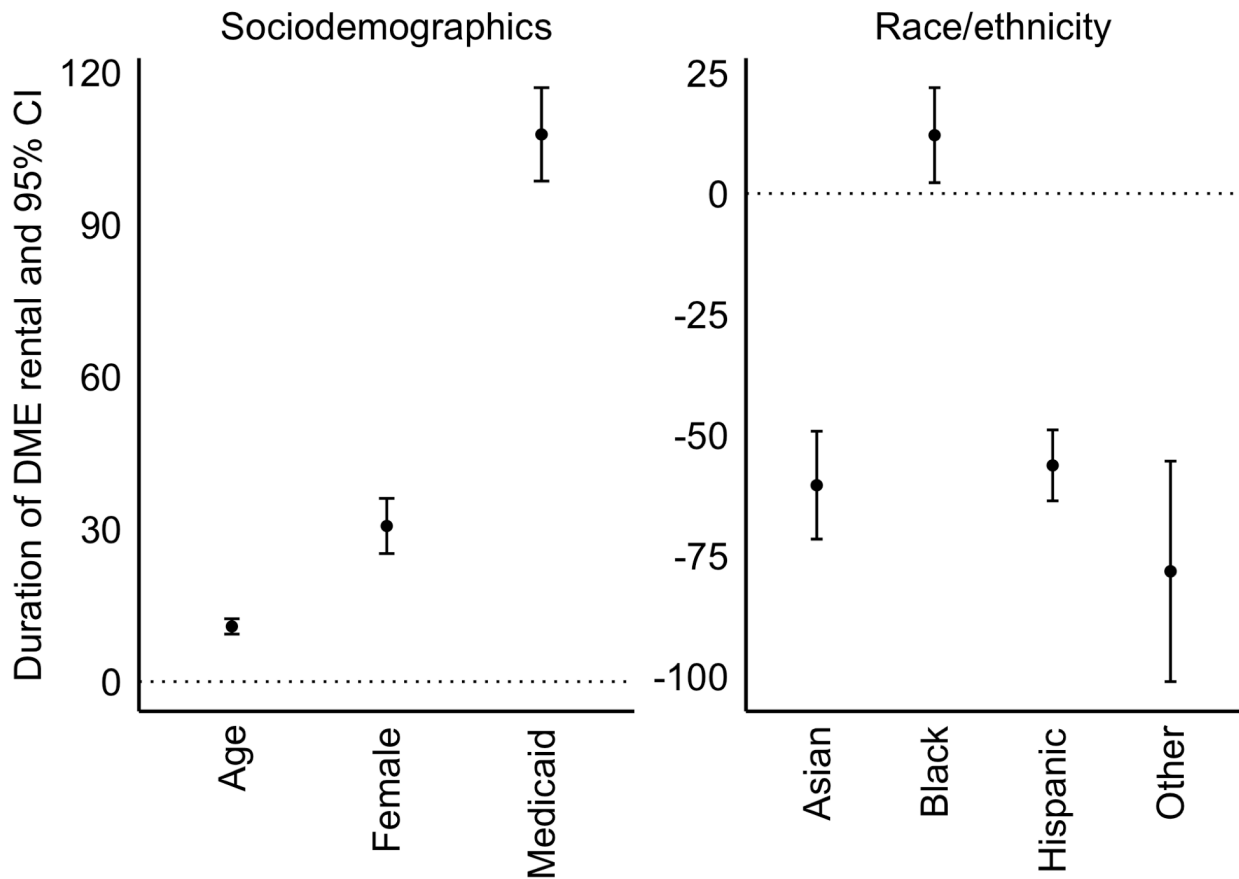
^aIncludes all non-breast pump DME rental types: Bilevel Positive Airway Pressure (BiPAP) machines, enteral feeding machines, hospital beds, infusion pumps, oxygen equipment, suction pumps, ventilators, and wheelchairs.

^bGeneralized hierarchical linear model with a random intercept for ZIP code, adjusted for KPSC member age, sex, race/ethnicity, Medicaid status, and ZIP code-level median household income.

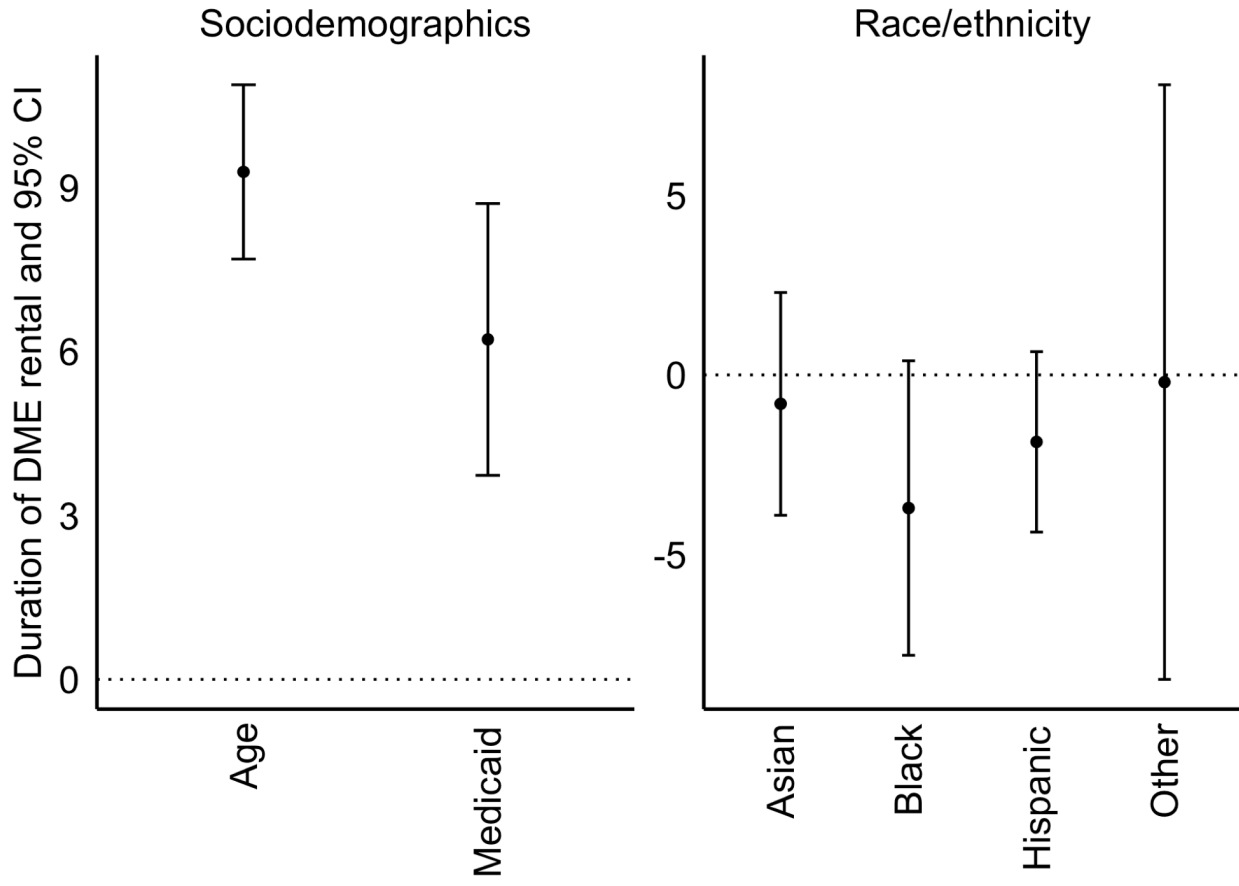
^cGeneralized hierarchical linear model with a random intercept for ZIP code, Adjusted for KPSC member age, race/ethnicity, Medicaid status, and ZIP code-level median household income.

Notes. DME, durable medical equipment, SES, socioeconomic status.

A Non-breast pump renters^{a,b}



B Breast pump renters^c



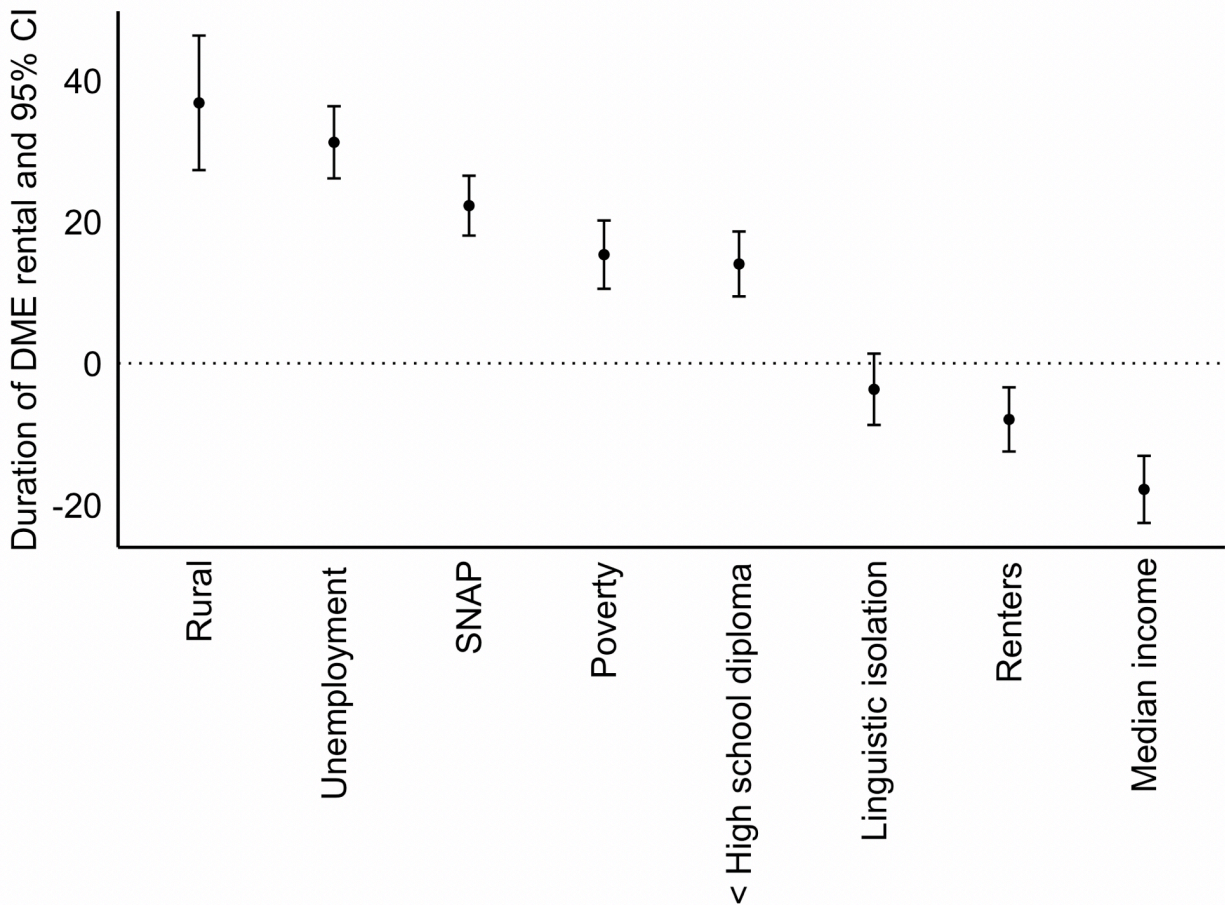
eFigure 11: Duration of cumulative DME rentals^a by Kaiser Permanente Southern California members, 2008–2018 by ZIP code-level sociodemographic factors in A) Sociodemographic variables modeled individually; B) Sociodemographic variables modeled jointly after selection via LASSO.

^aIncludes all non-breast pump DME rental types: Bilevel Positive Airway Pressure (BiPAP) machines, enteral feeding machines, hospital beds, infusion pumps, oxygen equipment, suction pumps, ventilators, and wheelchairs.

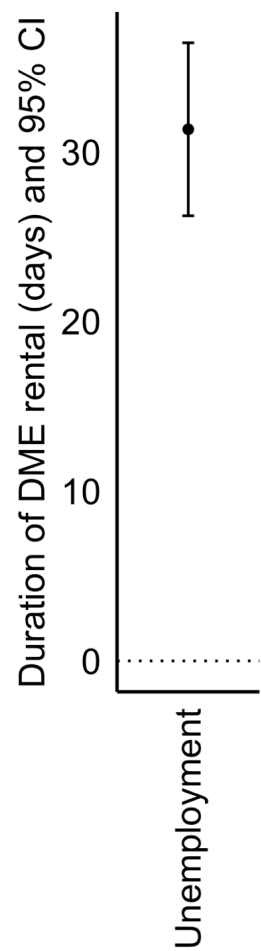
^bGeneralized hierarchical linear model with a random intercept for ZIP code, adjusted for KPSC member age, sex, race/ethnicity, and Medicaid status.

Notes. DME, durable medical equipment, SES, socioeconomic status.

A ZIP code-level sociodemographic variables modeled individually



B ZIP code-level variables modeled jointly after selection via LASSO



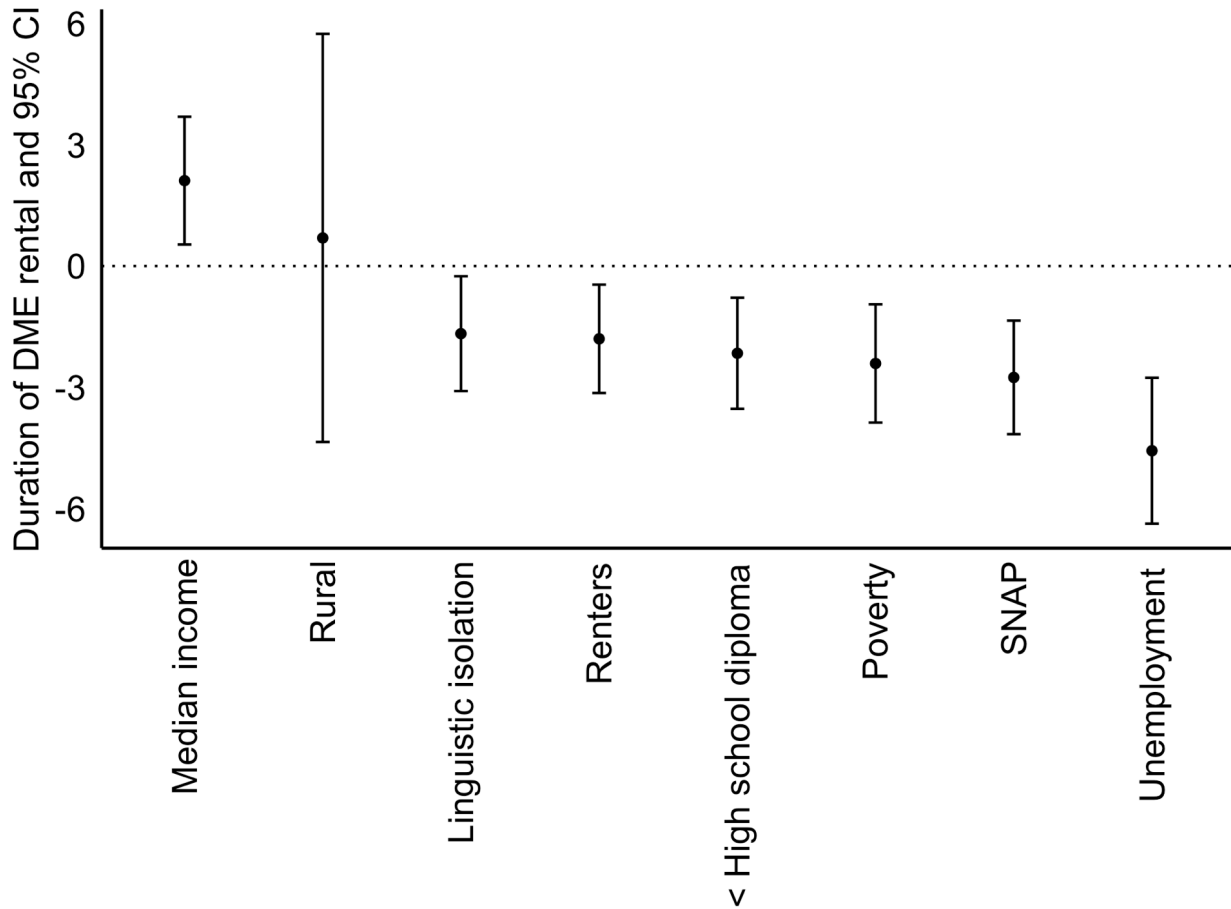
eFigure 12: Duration of cumulative DME breast pump rentals by Kaiser Permanente Southern California members, 2008–2018 by ZIP code-level sociodemographic factors in A) SES variables modeled individually. No ZIP code-level variables were retained via LASSO.

^aIncludes all non-breast pump DME rental types: Bilevel Positive Airway Pressure (BiPAP) machines, enteral feeding machines, hospital beds, infusion pumps, oxygen equipment, suction pumps, ventilators, and wheelchairs.

^bGeneralized hierarchical linear model with a random intercept for ZIP code, adjusted for KPSC member age, race/ethnicity, and Medicaid status.

Notes. DME, durable medical equipment, SES, socioeconomic status.

A ZIP code-level SES variables modeled individually



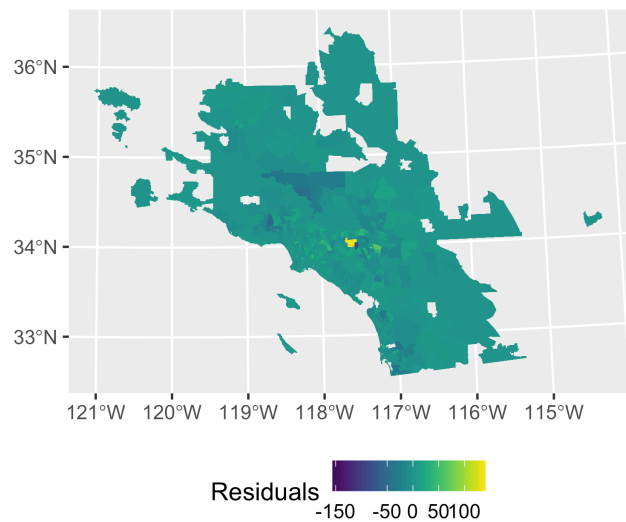
eFigure 13: Residuals from the hierarchical generalized linear model with a log-link and random intercept for ZIP code for (A) DME rentals^a; and (B) Breast pump DME rentals.

^aIncludes all non-breast pump DME rental types: Bilevel Positive Airway Pressure (BiPAP) machines, enteral feeding machines, hospital beds, infusion pumps, oxygen equipment, suction pumps, ventilators, and wheelchairs.

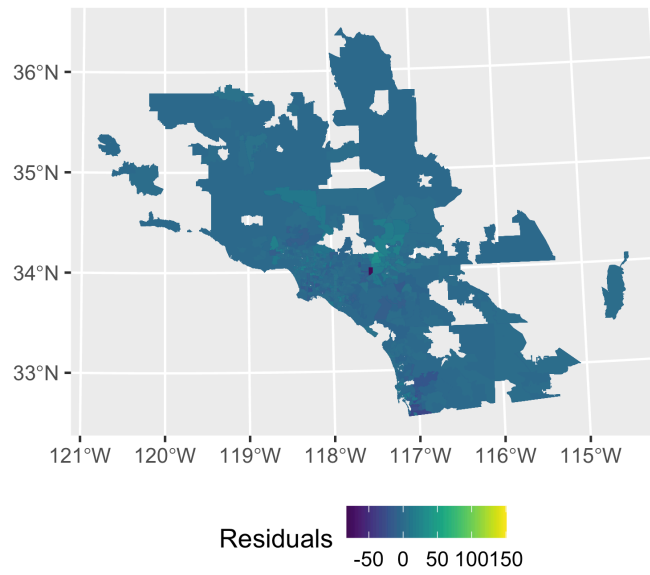
Models adjusted for year and descriptors of the ZIP code-level KPSC member population: mean age, percent Medicaid users, percent Hispanic, percent non-Hispanic Black, and percent female (non-breast pump models only). Grey areas were excluded from analysis (see Supplemental Figure 1). The residuals appear randomly distributed, indicating little remaining spatial residual autocorrelation. In addition, for both groups, Moran's I indicated residuals were consistent with spatial randomness.

Notes. DME, durable medical equipment.

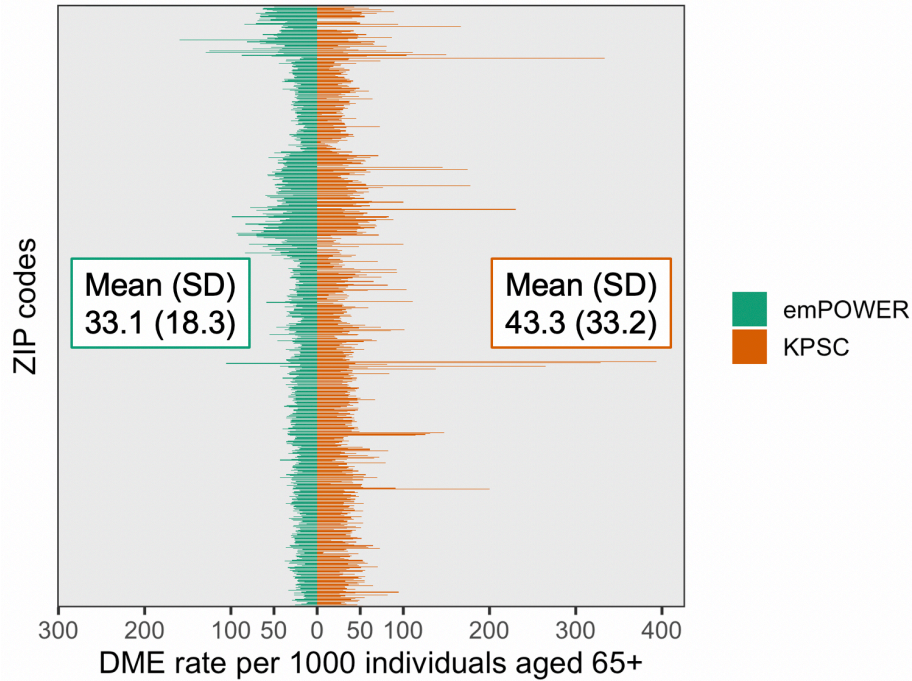
A DME rental model residuals



B Breast pump rental model residuals



eFigure 14: Comparison between DME rates per 1,000 between Medicare beneficiaries and KPSC members aged 65+. The emPOWER rate represents the number of Medicare beneficiaries (using Part A, B, and/or C) using DME in November 2019 divided by the number of Medicare beneficiaries living in each ZIP code in November 2019. The KPSC rate represents the number of KPSC members who rented DME in 2018 divided by the number of KPSC members aged 65+ in each ZIP code in 2018.



eTable 1: Centers for Medicare & Medicaid Services Healthcare Common Procedure Coding System codes used to identify the 9 categories of DME.

| DME categories | HCPSC codes |
|-------------------------|---|
| Breast pump | 'E0604' |
| BiPAP | 'E0470','E0471','E0472' |
| Oxygen-related | 'E1390','E1391','E1392','E0424','E0425','E0430','E0431','E0433','E0434','E0435','E0439','E0440','K0738' |
| Ventilator | 'A7034','E0465','E0466','E0480','E0481','E0483','E0484','E0487','E0555','E0561','E0562','E0565','E0570','E0601','E0618','E0619', 'E1353','E0650','E0651','E0655','E0656','E0657','E0660','E0665','E0666','E0667','E0668','E0669','E0670','E0671','E0672','E0673' |
| Enteral feeding machine | 'B9002' |
| Infusion pump | 'E0779','E0780','E0781','E0784','E0791','K0455','E0782','E0783','E0785','E0786' |
| Suction pump | 'E0600','K0743' |
| Hospital bed | 'E0295','E0297','E0303','E0304','E0260','E0261','E0265','E0266' |
| Wheelchair | 'E1230','K0800','K0801','K0802','K0806','K0807','K0808','K0812','E1031','E1035','E1036','K0010','K0011','K0012','K0013','K0014','K0813','K0814','K0815','K0816','K0820','K0821','K0822','K0823','K0824','K0825','K0826','K0827','K0828','K0829','K0830','K0831','K0835','K0836','K0837','K0838','K0839','K0840','K0841','K0842','K0843','K0848','K0849','K0850','K0851','K0852','K0853','K0854','K0855','K0856','K0857','K0858','K0859','K0860','K0861','K0862','K0863','K0864','K0868','K0869','K0870','K0871','K0877','K0878','K0879','K0880','K0884','K0885','K0886','K0890','K0891','K0898' |
| Others | A4670,'E0603','E0747','E0748','E0760','E0770','E0766','E2000','Q0477','Q0478','Q0479' |

Notes. DME, durable medical equipment; HCPSC, Healthcare Common Procedure Coding System

eTable 2: Prevalence of DME rentals by category at Kaiser Permanente Southern California, 2008–2018

| Category | Prevalence per 1,000 person-years | | | | | | | | | | |
|--------------------------|-----------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| Breast pumps | 5.59 (5.43, 5.74) | 7.53 (7.35, 7.71) | 8.20 (8.01, 8.38) | 9.03 (8.84, 9.22) | 9.62 (9.43, 9.81) | 11.93 (11.72, 12.15) | 13.74 (13.52, 13.97) | 14.52 (14.30, 14.74) | 16.03 (15.80, 16.26) | 17.82 (17.58, 18.06) | 20.16 (19.90, 20.42) |
| BiPAP machines | 0.12 (0.11, 0.13) | 0.24 (0.22, 0.25) | 0.32 (0.30, 0.34) | 0.37 (0.35, 0.39) | 0.40 (0.38, 0.42) | 0.47 (0.45, 0.49) | 0.41 (0.39, 0.43) | 0.39 (0.37, 0.41) | 0.36 (0.34, 0.38) | 0.35 (0.33, 0.37) | 0.42 (0.40, 0.43) |
| Oxygen equipment | 1.79 (1.75, 1.84) | 2.68 (2.63, 2.74) | 3.26 (3.20, 3.32) | 3.50 (3.44, 3.56) | 3.80 (3.74, 3.86) | 4.63 (4.57, 4.70) | 4.99 (4.93, 5.06) | 4.92 (4.85, 4.99) | 5.06 (5.00, 5.13) | 5.17 (5.11, 5.24) | 5.22 (5.16, 5.29) |
| Ventilators | 0.12 (0.11, 0.13) | 0.16 (0.15, 0.18) | 0.17 (0.16, 0.18) | 0.18 (0.17, 0.20) | 0.18 (0.17, 0.20) | 0.20 (0.19, 0.21) | 0.20 (0.19, 0.22) | 0.20 (0.18, 0.21) | 0.21 (0.20, 0.23) | 0.24 (0.22, 0.25) | 0.22 (0.21, 0.24) |
| Enteral feeding machines | 0.17 (0.16, 0.18) | 0.32 (0.30, 0.34) | 0.37 (0.35, 0.39) | 0.37 (0.35, 0.39) | 0.36 (0.34, 0.38) | 0.38 (0.36, 0.40) | 0.34 (0.32, 0.36) | 0.30 (0.28, 0.32) | 0.28 (0.27, 0.30) | 0.27 (0.25, 0.28) | 0.27 (0.25, 0.28) |
| Infusion pumps | 0.51 (0.49, 0.53) | 0.66 (0.64, 0.69) | 0.63 (0.60, 0.65) | 0.68 (0.66, 0.71) | 0.68 (0.65, 0.71) | 0.70 (0.67, 0.73) | 0.69 (0.67, 0.72) | 0.68 (0.65, 0.70) | 0.65 (0.63, 0.68) | 0.56 (0.54, 0.58) | 0.50 (0.48, 0.52) |
| Suction pumps | 0.21 (0.19, 0.22) | 0.29 (0.27, 0.31) | 0.35 (0.33, 0.36) | 0.38 (0.36, 0.40) | 0.40 (0.38, 0.42) | 0.45 (0.43, 0.47) | 0.42 (0.40, 0.44) | 0.39 (0.37, 0.41) | 0.37 (0.35, 0.39) | 0.39 (0.37, 0.41) | 0.43 (0.41, 0.45) |
| Hospital beds | 1.41 (1.37, 1.45) | 2.14 (2.09, 2.19) | 2.63 (2.58, 2.68) | 3.01 (2.95, 3.06) | 3.30 (3.24, 3.36) | 4.07 (4.00, 4.13) | 4.45 (4.38, 4.51) | 4.21 (4.15, 4.27) | 4.08 (4.02, 4.13) | 4.31 (4.25, 4.37) | 4.44 (4.38, 4.50) |
| Wheelchairs | 0.05 (0.04, 0.06) | 0.06 (0.05, 0.07) | 0.06 (0.05, 0.07) | 0.07 (0.06, 0.07) | 0.07 (0.06, 0.07) | 0.06 (0.05, 0.06) | 0.05 (0.04, 0.06) | 0.04 (0.04, 0.05) | 0.04 (0.03, 0.04) | 0.04 (0.03, 0.04) | 0.03 (0.03, 0.04) |
| Other | 0.02 (0.01, 0.02) | 0.02 (0.01, 0.02) | 0.02 (0.02, 0.02) | 0.02 (0.01, 0.02) | 0.02 (0.02, 0.02) | 0.02 (0.01, 0.02) | 0.02 (0.02, 0.03) | 0.02 (0.02, 0.02) | 0.02 (0.01, 0.02) | 0.02 (0.01, 0.02) | 0.02 (0.01, 0.02) |

Notes. BiPAP, Bilevel Positive Airway Pressure; DME, durable medical equipment

eTable 3: Prevalence of DME rentals by age, sex, racial/ethnic, and Medicaid categories at Kaiser Permanente Southern California, 2008–2018

| Category | Prevalence per 1,000 person-years | | | | | | | | | | |
|-----------------------|-----------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| Sex/age | | | | | | | | | | | |
| Females, 0-17 | 0.68 (0.60, 0.76) | 0.94 (0.85, 1.03) | 0.99 (0.90, 1.08) | 0.98 (0.89, 1.07) | 1.05 (0.96, 1.15) | 1.10 (1.01, 1.20) | 1.08 (0.99, 1.18) | 0.99 (0.90, 1.08) | 1.04 (0.95, 1.14) | 0.97 (0.88, 1.06) | 0.78 (0.70, 0.86) |
| Females, 18-64 | 6.00 (5.86, 6.14) | 8.24 (8.08, 8.40) | 8.92 (8.75, 9.09) | 9.76 (9.59, 9.93) | 10.27 (10.10, 10.45) | 12.26 (12.07, 12.45) | 13.52 (13.33, 13.72) | 14.04 (13.85, 14.24) | 15.21 (15.01, 15.41) | 16.51 (16.31, 16.71) | 18.13 (17.91, 18.34) |
| Females, 65+ | 23.16 (22.50, 23.82) | 33.92 (33.14, 34.70) | 39.88 (39.06, 40.70) | 43.50 (42.67, 44.33) | 45.48 (44.67, 46.29) | 50.45 (49.62, 51.27) | 50.95 (50.15, 51.75) | 50.53 (49.75, 51.30) | 48.85 (48.11, 49.59) | 49.86 (49.14, 50.59) | 47.64 (46.94, 48.34) |
| Males, 0-17 | 0.69 (0.62, 0.77) | 0.91 (0.83, 1.00) | 0.97 (0.88, 1.06) | 1.04 (0.94, 1.13) | 1.07 (0.98, 1.17) | 1.10 (1.00, 1.19) | 0.97 (0.88, 1.06) | 0.85 (0.77, 0.93) | 0.90 (0.81, 0.98) | 1.04 (0.95, 1.13) | 0.92 (0.83, 1.01) |
| Males, 18-64 | 1.91 (1.83, 2.00) | 2.76 (2.66, 2.86) | 2.98 (2.88, 3.08) | 3.09 (2.99, 3.19) | 3.10 (3.00, 3.20) | 3.39 (3.28, 3.49) | 3.39 (3.29, 3.49) | 3.18 (3.09, 3.28) | 3.17 (3.08, 3.26) | 3.09 (3.00, 3.18) | 3.17 (3.08, 3.26) |
| Males, 65+ | 24.05 (23.32, 24.79) | 34.28 (33.43, 35.14) | 39.71 (38.82, 40.61) | 42.34 (41.45, 43.23) | 43.97 (43.10, 44.84) | 48.20 (47.32, 49.08) | 49.43 (48.57, 50.30) | 48.01 (47.19, 48.84) | 47.44 (46.64, 48.24) | 48.11 (47.33, 48.89) | 45.69 (44.94, 46.44) |
| Race/ethnicity | | | | | | | | | | | |
| Non-Hispanic Asian | 4.68 (4.43, 4.92) | 6.77 (6.48, 7.05) | 7.43 (7.14, 7.72) | 8.13 (7.84, 8.42) | 8.41 (8.13, 8.70) | 9.67 (9.37, 9.97) | 10.63 (10.32, 10.94) | 11.14 (10.84, 11.45) | 11.30 (11.00, 11.60) | 12.47 (12.16, 12.77) | 13.38 (13.05, 13.70) |
| Non-Hispanic Black | 7.03 (6.74, 7.32) | 10.68 (10.33, 11.04) | 12.33 (11.94, 12.71) | 13.58 (13.19, 13.98) | 14.42 (14.02, 14.82) | 16.82 (16.39, 17.26) | 17.50 (17.06, 17.93) | 17.37 (16.94, 17.80) | 17.69 (17.27, 18.12) | 18.61 (18.17, 19.05) | 19.71 (19.25, 20.17) |
| Non-Hispanic White | 8.15 (7.99, 8.32) | 11.41 (11.22, 11.60) | 12.94 (12.74, 13.14) | 14.01 (13.81, 14.22) | 14.81 (14.60, 15.02) | 17.03 (16.81, 17.25) | 17.89 (17.66, 18.11) | 17.92 (17.70, 18.14) | 18.22 (18.00, 18.44) | 18.74 (18.52, 18.96) | 18.91 (18.68, 19.13) |

| | | | | | | | | | | | |
|------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|--------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| Other | 0.96 (0.87, 1.05) | 1.46 (1.35, 1.58) | 1.65 (1.51, 1.78) | 1.54 (1.40, 1.68) | 1.58 (1.43, 1.73) | 1.75 (1.59, 1.91) | 1.80 (1.64, 1.96) | 1.70 (1.56, 1.84) | 1.78 (1.64, 1.92) | 1.88 (1.74, 2.01) | 2.49 (2.32, 2.65) |
| Hispanic | 4.04 (3.93, 4.14) | 5.61 (5.49, 5.74) | 6.33 (6.19, 6.46) | 6.82 (6.69, 6.96) | 7.34 (7.21, 7.48) | 8.64 (8.50, 8.79) | 9.42 (9.28, 9.57) | 9.66 (9.51, 9.80) | 10.36 (10.21, 10.51) | 11.30 (11.15, 11.45) | 12.29 (12.13, 12.44) |
| Medicaid status | | | | | | | | | | | |
| Medicaid/non-breast pump | 2.06 (1.87, 2.25) | 3.08 (2.87, 3.29) | 3.48 (3.26, 3.70) | 3.61 (3.39, 3.83) | 3.88 (3.66, 4.09) | 4.71 (4.47, 4.95) | 5.23 (5.00, 5.47) | 9.83 (9.53, 10.12) | 10.80 (10.50, 11.09) | 11.57 (11.28, 11.87) | 11.96 (11.65, 12.28) |
| Medicaid/breast pump | 5.08 (4.50, 5.66) | 7.60 (6.94, 8.26) | 8.03 (7.37, 8.69) | 8.54 (7.89, 9.20) | 9.52 (8.85, 10.19) | 11.73 (10.98, 12.48) | 15.62 (14.82, 16.43) | 18.30 (17.50, 19.10) | 20.59 (19.79, 21.39) | 23.11 (22.28, 23.94) | 26.30 (25.39, 27.21) |
| Non-Medicaid/non-breast pump | 3.94 (3.88, 4.01) | 5.84 (5.76, 5.93) | 6.91 (6.82, 7.00) | 7.60 (7.50, 7.69) | 8.18 (8.08, 8.27) | 9.25 (9.15, 9.35) | 9.50 (9.41, 9.60) | 8.82 (8.73, 8.91) | 8.64 (8.55, 8.73) | 8.74 (8.65, 8.83) | 8.94 (8.85, 9.04) |
| Non-Medicaid/breast pump | 5.62 (5.46, 5.78) | 7.53 (7.34, 7.71) | 8.21 (8.02, 8.41) | 9.07 (8.87, 9.27) | 9.63 (9.43, 9.83) | 11.95 (11.73, 12.18) | 13.56 (13.32, 13.79) | 14.10 (13.87, 14.34) | 15.48 (15.24, 15.72) | 17.19 (16.94, 17.44) | 19.42 (19.15, 19.69) |

Notes. BiPAP, Bilevel Positive Airway Pressure; DME, durable medical equipment

| eTable 4: ZIP code-level rate ratio for DME rentals by Kaiser Permanente Southern California members, 2008–2018 | | |
|--|------------------------------------|--------------------------------|
| | DME category | |
| | Non-breast pump^a | Breast pump |
| Year | RR (95% CI)^b | RR (95% CI)^c |
| 2008 | REF | REF |
| 2009 | 1.4 (1.4, 1.5) | 1.3 (1.3, 1.4) |
| 2010 | 1.6 (1.6, 1.7) | 1.5 (1.4, 1.5) |
| 2011 | 1.8 (1.7, 1.8) | 1.6 (1.5, 1.7) |
| 2012 | 1.9 (1.8, 1.9) | 1.7 (1.6, 1.8) |
| 2013 | 2.1 (2.1, 2.2) | 2.1 (2.0, 2.3) |
| 2014 | 2.1 (2.1, 2.2) | 2.4 (2.3, 2.6) |
| 2015 | 2.0 (2.0, 2.1) | 2.6 (2.4, 2.7) |
| 2016 | 2.0 (1.9, 2.0) | 2.8 (2.6, 3.0) |
| 2017 | 2.0 (1.9, 2.0) | 3.1 (2.9, 3.3) |
| 2018 | 1.9 (1.8, 1.9) | 3.6 (3.4, 3.8) |

Notes. DME, durable medical equipment

^a Includes all non-breast pump DME rental types: Bilevel Positive Airway Pressure (BiPAP) machines, enteral feeding machines, hospital beds, infusion pumps, oxygen equipment, suction pumps, ventilators, and wheelchairs.

^b Generalized hierarchical Poisson model with a random intercept for ZIP code, adjusted for year, ZIP code-level median household income, and descriptors of the ZIP code-level KPSC member population: mean age, percent Medicaid users, percent Hispanic members, percent non-Hispanic Black members, and percent female members. ZIP code-level models not adjusted for ZIP code-level median household income.

^c Generalized hierarchical Poisson model with a random intercept for ZIP code, adjusted for year ZIP code-level median household income, and descriptors of the ZIP code-level KPSC member population: mean age, percent Medicaid users, percent Hispanic members and percent non-Hispanic Black members. ZIP code-level models not adjusted for ZIP code-level median household income.

eTable 5: Mean and standard deviation of ZIP code-level socioeconomic factors among Kaiser Permanente Southern California members' ZIP codes

| ZIP code-level variable | DME category | |
|-----------------------------|------------------|---------------|
| | DME ^a | Breast pump |
| | Mean (SD) | Mean (SD) |
| Median household income, \$ | 64944 (25660) | 65178 (25714) |
| Poverty, % | 14.9 (9.4) | 15.0 (9.4) |
| SNAP, % | 6.7 (6.2) | 6.9 (6.2) |
| Linguistic isolation, % | 10.1 (9.6) | 10.5 (9.5) |
| Renters, % | 42.4 (18.7) | 43.1 (24.5) |
| < High school education, % | 18.5 (14.5) | 18.9 (14.7) |
| Rural, % | 11.1 (28.1) | 8.6 (24.5) |
| Unemployment, % | 11.0 (4.6) | 11.1 (4.4) |

Notes. DME, durable medical equipment; SNAP, Supplemental Nutrition Assistance Program

^a Includes all non-breast pump DME rental types: Bilevel Positive Airway Pressure (BiPAP) machines, enteral feeding machines, hospital beds, infusion pumps, oxygen equipment, suction pumps, ventilators, and wheelchairs.

eTable 6: ZIP code-level rate ratio for electric DME rentals by Kaiser Permanente Southern California member ZIP code-level socioeconomic factors, 2008–2018

| | DME^a | Breast pump |
|--|--------------------------------|--------------------------------|
| ZIP code-level variable^b | RR (95% CI)^c | RR (95% CI)^d |
| Median household income | 0.9 (0.9, 1.0) | 1.0 (1.0, 1.1) |
| Poverty | 1.1 (1.0, 1.1) | 1.0 (0.9, 1.0) |
| SNAP | 1.1 (1.1, 1.2) | 0.83 (0.78, 0.88) |
| Linguistic isolation ^e | 1.0 (0.9, 1.0) | 1.1 (1.1, 1.2) |
| Renters | 1.0 (0.9, 1.0) | 1.1 (1.1, 1.2) |
| <High school education | 1.1 (1.1, 1.2) | 0.9 (0.9, 1.0) |
| Rural | 1.0 (1.0, 1.1) | 0.88 (0.82, 0.94) |
| Unemployment | 1.1 (1.1, 1.1) | 0.83 (0.79, 0.88) |
| Age ≥ 65 years | 1.0 (0.9, 1.0) | Not estimated |
| % Non-Hispanic Asian | 1.0 (0.9, 1.0) | 1.2 (1.1, 1.2) |
| % Non-Hispanic Black | 1.2 (1.1, 1.3) | 0.9 (0.9, 1.0) |
| % Non-Hispanic White | 1.0 (0.9, 1.0) | 0.86 (0.83, 0.89) |
| % Hispanic | 1.1 (1.1, 1.1) | 1.0 (1.0, 1.0) |

Notes. DME, durable medical equipment; KPSC, Kaiser Permanente Southern California; RR, rate ratio; SNAP, Supplemental Nutrition Assistance Program

^a Includes all non-breast pump DME rental types: Bilevel Positive Airway Pressure (BiPAP) machines, enteral feeding machines, hospital beds, infusion pumps, oxygen equipment, suction pumps, ventilators, and wheelchairs.

^b RR per SD-increase in ZIP code level variable, see eTable 4 for SD by variable.

^c Generalized hierarchical Poisson model with a random intercept for ZIP code, adjusted for year, ZIP code-level median household income, and descriptors of the ZIP code-level KPSC member population: mean age, percent Medicaid users, percent Hispanic members, percent non-Hispanic Black members, and percent female members. ZIP code-level models not adjusted for ZIP code-level median household income.

^d Generalized hierarchical Poisson model with a random intercept for ZIP code, adjusted for year ZIP code-level median household income, and descriptors of the ZIP code-level KPSC member population: mean age, percent Medicaid users, percent Hispanic members and percent non-Hispanic Black members. ZIP code-level models not adjusted for ZIP code-level median household income.

^e Linguistically isolated was defined as no one in household older than 14 speaks English 'very well.'

eTable 7: Odds ratio and 95% for a Kaiser Permanente Southern California member renting two or more categories of DME^a during the study period, 2008–2018

| Variable | OR (95% CI)^b |
|-----------------|--------------------------------|
| Age | 1.4 (1.4, 1.4) |
| Female sex | 0.84 (0.82, 0.86) |
| Medicaid | 1.3 (1.2, 1.4) |
| Race/ethnicity | |
| Non-Hispanic | |
| Asian | 1.4 (1.3, 1.4) |
| Black | 1.2 (1.2, 1.3) |
| White | REF |
| Other | 1.0 (0.9, 1.1) |
| Hispanic | 1.3 (1.3, 1.4) |

Notes. DME, durable medical equipment.

^aCategories include Bilevel Positive Airway Pressure (BiPAP) machines, enteral feeding machines, hospital beds, infusion pumps, oxygen equipment, suction pumps, ventilators, wheelchairs, and breast pumps.

^bResults from a hierarchical logistic model with random intercept for ZIP code, which adjusted for KPSC member age, race/ethnicity, Medicaid status, and ZIP code-level median household income.

eMethods

After running separate models, we included all predictors in a single model and used LASSO (Least Absolute Shrinkage and Selection Operator) to select a subset of predictors by shrinking (regularizing) some model coefficients to zero based on a balance of minimizing the mean-squared error with a penalty parameter (λ). We used a split-sample analysis to train and test the LASSO algorithm and retained variables based on a λ one standard error above the λ associated with the lowest mean-squared error. As λ approaches 0, the model becomes equivalent to the original unpenalized model; a larger λ penalizes coefficients more strongly and shrinks some to zero. The selected variables were included in our final hierarchical generalized linear model.