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Support from Adult Children and Parental Health in Rural America

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Cover Page Footnote

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ABSTRACT
Adult children are a primary source of care for their aging parents. Parents in rural areas, however, live further from their adult children than parents in urban areas, potentially limiting the support they receive and compromising their health and ability to age in place. We use two waves of the Panel Study of Income Dynamics (2013 and 2017) to investigate the relationships among geographic proximity, adult children's instrumental and financial support, and parental health. Rural parents live further from their adult children and receive less financial support, but they are more likely to receive instrumental assistance. In addition, rural parents have worse health and more functional limitations than urban parents, and these differences persist after controlling for proximity to and support from adult children. Our findings indicate that factors beyond proximity influence the complex relationships between spatial and social boundaries and their consequences for older adults' health and well-being.

KEYWORDS
Aging, health, kin support, proximity, rural

INTRODUCTION

Rural America is older and aging more rapidly than urban America (Glasgow and Brown 2012; Smith and Trevelyan 2019). Nearly 18 percent of the U.S. population living in nonmetro counties is age 65 or older compared to 14 percent in metro counties (Smith and Trevelyan 2019). These older rural adults also have worse self-rated health, higher rates of

several chronic diseases, and more functional limitations than their urban peers (Berry 2014; Cohen et al. 2018; Sage et al. 2019; Zhao et al. 2019). Yet, rural communities often lack the health services, resources, and other supports that older adults need, requiring many aging rural adults to rely on their adult children for their caretaking needs (Nemet and Bailey 2000; Whitener 2005). Young and working-age adults, however, often leave rural areas, while some rural areas have experienced an influx of near retirement age and older adults (Berry and Kirschner 2013). As a consequence, rural parents may be simultaneously more dependent on their adult children for care and have fewer adult children living nearby (Choi et al. 2020).

Despite these concerns, we know little about how rural-urban differences in intergenerational proximity affect support from adult children or how these potential differences in support, in turn, may influence their parents' health and wellbeing. This article helps fill this gap in the existing research by examining differences in intergenerational proximity, support from adult children, and parents' health in rural and urban contexts. It makes two specific contributions. First, although prior studies indicate that rural parents live further away from their adult children than urban parents, it is not known whether they consequently receive less instrumental and financial support from their adult children. Second, to our knowledge, no prior study has assessed whether differences in proximity to or support from adult children helps account for different health outcomes and aging processes of rural and urban older adults. Understanding the geographic and social patterns of intergenerational support and their effect on middle-aged and older adult health is important to reduce rural-urban disparities in health and improve population health and aging generally. Accordingly, we address two primary research questions:

1. Do adult children's instrumental and financial support of their middle-aged and older parents differ by metro status, and how does proximity influence support?
2. What role do adult children's proximity to and support of their parents play in explaining the rural health disadvantage among middle-aged and older adults?

We address these questions by drawing on two recent waves of the Panel of Income Dynamics Survey (PSID). First, using data from a supplemental module on transfers from the 2013 PSID and restricted geographic data, we measure differences in instrumental and financial support by metro status and assess whether greater geographic intergenerational distances limit the support rural parents receive. Second, we examine whether

differences in proximity and support by metro status help explain rural-urban health disparities among older parents. Our analyses of parental health focus on self-rated overall health and functional limitations, as prior research suggests that these conditions are not only worse in rural areas, but also that they are associated with proximity to and support from adult children. To minimize endogeneity with respect to parental health, we assess parental health measures in 2017, while adjusting for support from adult children and parental health status in 2013. Our sample of parents focuses on adults who are 50 or older and have at least one adult child, thus comprising a broad range of middle-aged and older adults.

BACKGROUND

Metro Status and Support from Adult Children

Our first research question focuses on metro status differences in support parents receive from their adult children. Adult children are often the primary caregivers of their parents, assisting with household chores, grocery shopping, transportation, and long-term care (Bianchi, McGarry, and Seltzer 2010). Families often address needs as a collective unit (Zhang, Engelman, and Agree 2013), and adult siblings may work together to support older parents (Lin and Wolf 2020). There are known differences in support by the age, gender, race, marital status, and socioeconomic status (SES) of both the adult child and parent (Grigoryeva 2017; Napolitano, Furstenberg, and Fingerman 2020; Park 2018; Silverstein, Gans, and Yang 2006). Yet, to our knowledge, no prior study has directly measured metro status differences in instrumental and financial support from adult children. From a theoretical perspective, whether parents in rural areas receive more or less help from their adult children than urban parents is ambiguous.

On the one hand, there are at least two reasons to expect that rural parents may receive more support from their adult children than urban parents. First, traditional rural values emphasize reciprocity, generosity, and care for others. Studies from the 1990s showed that older rural adults had stronger social support networks and were more likely to receive assistance from others than their urban counterparts (Amato 1993; Beggs, Haines, and Hurlbert 1996; Hofferth and Iceland 1998). More recent studies from the U.S. and elsewhere, however, show that differences in rural-urban social support are often small and depend on the particular type of social support that is measured (Beaudoin and Thorson 2004; Parker et al. 2018; Sørensen 2016; Ziersch et al. 2009). Studies on general support among all kin show higher levels of assistance and

financial exchanges in rural families, although prior studies do not specify whether this kin support comes from adult children (Henning-Smith Moscovice, and Kozhimannil 2019). Nonetheless, familial, especial filial, obligations of care may be stronger in rural areas. Second, adult children often increase both their practical and financial assistance in response to poor parental health. As will be discussed below, rural adults are less healthy with respect to many conditions (Berry 2014). Therefore, they may elicit more support from adult children as poor or declining parental health may motivate adult children to increase the instrumental and financial support they give to their parents (Cheng et al. 2013; Silverstein et al. 2006).

On the other hand, educational attainment, income, and wealth are substantially lower for adult children of rural parents than urban parents (Cromartie 2017). Lower SES of adult children may be critical in determining whether they can provide financial support to their parents. SES may be less important in determining the amount of in-kind or instrumental care adult children provide. In fact, instrumental support, which typically includes providing hands-on care, helping with chores, giving rides, or running errands, may be more dependent on geographic proximity than SES. Prior studies indicate that rural parents live further away from their adult children than urban parents (Choi et al. 2020). Greater physical distances may restrict adult children's ability to provide instrumental assistance by increasing the time, effort, and costs incurred. In fact, research shows that when parental health declines, adult children and their parents move closer to each other, presumably to facilitate greater instrumental care and assistance (Artamonova, Gillespie, and Brandén. 2020; Choi et al. 2015a; Silverstein et al. 2006; Spring et al. 2017; Vergauwen and Mortelmans 2020; Zhang et al. 2013). Adult children living nearby may also be more aware of their parents' needs related to food, heating, electricity, and health care. Hence, despite norms of familial support and poorer parental health, on balance, we expect that because of their lower SES and greater intergenerational distances, rural parents would receive less instrumental and financial support than urban parents.

Metro Status and Parental Health

Our second research question explores metro status differences in poor health and functional limitations. With few exceptions, adults living in rural areas have worse health outcomes than their urban peers, including worse self-rated physical and mental health, higher rates of several

chronic diseases, and more functional disabilities (Berry 2014; Cohen et al. 2018; Sage et al. 2019; Zhao et al. 2019). Much of the rural health disadvantage can be attributed to lower SES among older rural adults (Sage et al. 2019). Education, one of the strongest predictors of healthy aging and longevity, is markedly lower among rural adults (Marre 2017). Rural older adults also have lower incomes, receive lower Social Security payments, have less savings, are less likely to receive pensions, and have higher rates of poverty than their urban peers (Coburn 2002; Goins and Krout 2006; Mason-Baughman and Kisiday 2013).

A smaller, but growing, body of research has explored the links between proximity to adult children and parental health. One study in the U.S. found that having at least one adult child living nearby reduced the likelihood that older parents need to enter a nursing home or require formal care after the onset of new limitations performing activities of daily life (ADLs) (Choi et al. 2015b). Proximity to adult children is also associated with parents' improved psychological wellbeing, such as less psychological distress following widowhood or separation (Ha and Carr 2005; van der Pers, Mulder, and Steverink 2015). Studies from China find that parents with adult children living nearby are less depressed and can perform more ADLs than those who live further from their children (Li et al. 2020; Liang and Zhang 2017).

Implicit in many of these studies is the idea that closer intergenerational proximity facilitates greater support from adult children, although few prior studies directly measure how either financial or instrumental support from adult children may impact parental health. Many scholars have argued that kin support and family relationships, in general, shape the health and wellbeing of older adults through both physiological and psychosocial pathways (Carr and Utz 2020; Ehsan et al. 2019). Most prior studies focus on social capital or social support from a variety of sources that may include friends, neighbors, acquaintances, and colleagues as well as family members who are not necessarily adult children. Some scholars have argued that higher social capital in the rural U.S. plays a key health-promoting role (Yang, Jensen, and Haran 2011), although, as noted above, different forms of social capital may not be higher in rural areas (Beaudoin and Thorson 2004; Sørensen 2016). Further, other studies have indicated that types of social capital can have different effects on health. One U.S. study showed that while social contacts were associated with lower mortality among rural older adults, emotional support from friends and family was associated with higher mortality risk (Yang, Sun, and Choi 2020). They concluded that greater

reliance on emotional support may actually weaken self-efficacy and result in impaired health. Overall, higher levels of social support, which may include support from adult children, is likely to be associated with better health. However, if support from adult children is lower among rural compared to urban parents or if the support is inadequate in overcoming other rural disadvantages, then rural parents may experience worse health outcomes than their urban counterparts.

At the same time, there are several reasons to expect that proximity and support received from adult children may be more essential to the wellbeing of rural than urban parents. Rural older adults often lack the health and other services, resources, and supports required for healthy aging in place or must travel longer distances to access such services (Brown et al. 2008; Morton and Weng 2013; Park et al. 2010; Rhubart et al. 2021; Thiede et al. 2017). Consequently, many rural older adults rely on others, including their adult children, for their needs (Nemet and Bailey 2000; Whitener 2005). We expect that the greater distance between parents and adult children and the levels of support received will explain some of the worse health among rural adults.

CONCEPTUAL FRAMEWORK AND HYPOTHESES

Figure 1 provides a conceptual framework depicting the hypothesized relationships between metro status, intergenerational proximity, support from adult children, and parental health. Our first set of hypotheses pertain to support from adult children. We hypothesize that:

H1a: On average, rural parents will receive less instrumental and financial support from their adult children than urban parents.

H1b: Lower levels of support for rural parents will be partially explained by their greater geographic distance from their adult children.

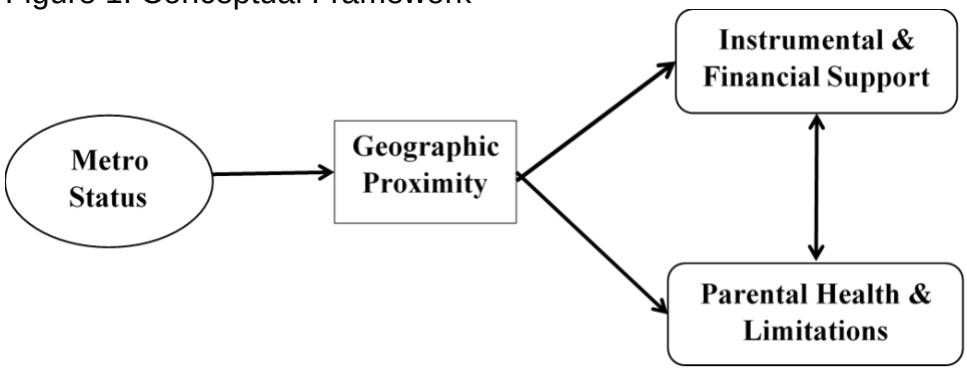
Our second set of hypotheses addresses differences in parental health by metro status:

H2a: Rural parents will be more likely than urban parents to have poor health and functional limitations.

H2b: Both greater intergenerational distances and less instrumental and financial support from adult children will help explain rural parents' health disadvantage.

Although we are interested in both support and parental health as primary outcomes, we note that there is a complex and bidirectional relationship between them (as indicated by a double arrow in Figure 1). As discussed in the literature above, while worse parental health may elicit greater support from adult children, such support may also improve parental

Figure 1: Conceptual Framework



health. Although the immediate effect of this support may be minimal, it may have important implications for parents' subsequent health. To assess H2a and H2b, we measure parents' subsequent health outcomes while controlling for their prior health status and support received from adult children. Establishing the chronological order of events helps mitigate reverse causality and allows us to better identify the roles of proximity and social support and health outcomes.

METHODS

Data

We used data from the Panel Study of Income Dynamics (PSID), a longitudinal, nationally-representative survey that began in 1968 and is collected every two years. These data are ideal because children of PSID respondents are recruited to participate, so the data offer information on both parents and their adult children. We used restricted data that include parent's county of residence, which enables us to identify county metro status.[1] We used data from two waves conducted in 2013 and 2017. The 2013 wave included the Rosters and Transfers module, which collected information on both time and economic transfers between each adult child and their parents. In addition, we included measures on the overall health and functional limitations of the respondent and their spouse or cohabiting partner in 2013 and 2017. Using health outcomes from 2017 allowed for support to occur before the health outcomes are measured and for a four-year period in which parental health status may change.

Our study used two samples: parents (N=3,742) and their adult children (N=10,264). PSID provides information on 6,230 parents (respondents and their spouses/partners) who were aged 50 or older and had at least one adult child (aged 18 or older) in 2013. Although we refer to our sample of parents as "older adults," we note that it includes both older middle-aged adults consisting of pre-retirement baby boomers, and

older adults, typically defined as those aged 65 and older. To maintain consistency across our analyses, we restricted our sample to parents (84.6 percent) who were re-interviewed in 2017 and removed 222 parents (5.6 percent) with missing values for any of the variables of interest. The remaining 3,742 parents with complete case information constitute our analytic sample for models of parental health outcomes. These parents provided complete information on 10,264 adult children, which comprised our sample for analyses of support received from adult children. Since parents and their children were nested within families, we employ the svy commands in Stata 16 to adjust for clustering at the family level. All estimates and models included the PSID survey weights designed to adjust for sample selection and attrition.

Measures

Proximity. Parents were asked to report the distance in miles between themselves and each of their adult children. We created a categorical variable in which each adult child was classified as “1” co-residing with their parent, “2” living within 30 miles of their parent, but not co-residing, “3” living between 30 miles and 200 miles away, “4” living between 200 and 500 miles away, and “5” living 500 or more miles away. Prior research (Choi et al. 2015b, 2020) has typically dichotomized adult children as either living “nearby” (if they co-resided or lived less than 30 miles away) or not (if they lived 30 or more miles away). Researchers often choose 30 miles to represent the distance where having regular, even daily, contact is feasible. Hence, we sometimes use the term “nearby” to refer to distances less than 30 miles (including co-residence), but generally prefer our more nuanced categorical measure of distance. We did not use a continuous measure of distance, as different modes of transportation (e.g., cars vs. airplanes) likely render the relationship between distance and support non-linear. Following prior studies (Choi 2020), we created another categorical variable that used the same categories of distance, but reflected the nearest adult child to the parent (rather than each adult child).

Support from adult children. Measures of support relied on two main questions answered by parents. Respondents were first given a prompt: “Families sometimes help each other with activities such as errands, rides, chores, babysitting, or hands-on care.” They were then asked whether they received such help from each of their adult children in the past year. We refer to this help as “instrumental support.” We created one variable to indicate whether the parent reported receiving at least 20

hours of help from that specific child and another variable at the parent-level to measure whether the parent received at least 20 hours of help in total from their adult children. To measure financial support, we created two analogous variables to indicate whether the parent reported receiving any money, loans, or gifts of $200 or more in the last year from that particular child and in total from all children. Higher thresholds were not used because too few children reported giving larger amounts. Sensitivity analyses (not shown) employing lower thresholds of support (one hour of help and $100) yielded similar substantive results.

Parental health. We focus on two specific parental health conditions that may be related to proximity to and support from adult children. First, we used a measure of parents' self-rated overall health. Parents who report having poor or fair health were coded as "1," while those reporting good, very good, or excellent health were coded as "0." Supplemental analyses (available upon request) indicated that results were not sensitive to the operationalization of poor health. Second, we created a dichotomous indicator that reflects whether the parent had any condition that limited their ability to work or to perform any of six ADLs (bathing, dressing, eating, walking, getting in or out of a bed or chair, or using the toilet). We created this composite measure of "functional limitation" as our sample of parents included both those of pre-retirement age, who may experience work related limitations, and those post-retirement, when limitations in ADLs are more likely to be present. Both health conditions were measured in 2013 and 2017. In sensitivity analyses (described below), parental health conditions were also measured in 2009 to allow for four-year time intervals between 2009, 2013, and 2017.

Metro status. Parent metro status is based on the 2013 USDA Economic Research Service Rural-Urban Continuum Codes (RUCCs), which reflected 2010 Census data (Economic Research Service 2021). Counties with RUCCs 1 to 3 were classified as metro (urban), and 4 to 9 were classified as nonmetro (rural).

SES characteristics. SES is likely to be associated with both children's ability to provide support and parents' health (Napolitano et al. 2020). We captured SES by parents' and adult children's highest level of education (less than high school, completed high school, some college, completed college, or more than college) and total family income (< $25,000, $25,000 to < $50,000, $50,000 to < $75,000, and >=$75,000). Information on adult children's education and income was from the PSID individual data files. Approximately one-third of the adult children reported by parents were not in the PSID study and, therefore, have missing data

on education and income. Rather than dropping them, we created a separate category for children with missing data on education and income. Analyses using parents' reports of children's education and income yielded similar findings (not shown), but are presumably less accurate.

Demographic characteristics. In addition, several demographic characteristics are known to be associated with intergenerational proximity, support, and health (Bianchi et al. 2010; Choi et al. 2015a, 2015b, 2020; Grigoryeva 2017; Park 2018; Silverstein et al. 2006). Although not the primary focus of our analyses, we adjusted for parent and child ages and sexes in 2013, race (White, African-American, and other),[2] whether the parent or adult child had a spouse or a cohabiting partner, and total number of adult siblings.

Analytic Plan

Our first set of analyses examined metro status differences in instrumental support and financial assistance parents received from adult children in 2013. These analyses used the adult child sample (N=10,264), controlled for total number of adult children, and were clustered at the family-level. We first assessed metro status differences in receipt of help or money from adult children, controlling for parents' and children's demographic characteristics. We then included our categorical proximity measure to determine whether differences in proximity explain rural-urban variation in support from adult children. Our third model included measures of parents' overall health and functional limitations in 2013 to examine whether current parental health is associated with support from adult children. To assess reverse causality, we also examined the association between health status four years earlier in 2009 and support from adult children in 2013 (presented in Appendix A). This limited our sample of adult children to 9,990. Our final model included measures of both parents' and adult children's educational attainment and family income in the preceding year.

Our second set of analyses used the parent sample (N=3,742) and focus on metro status differences in parental health (self-rated health and functional limitations) in 2017. To mitigate the effects of reverse causality, we controlled for parents' health status in 2013 in all models. All models adjusted for parents' demographic characteristics. Our second model assessed whether differences in proximity contribute to rural-urban health disparities by adding our measure of the nearest adult child. Third, we included measures of instrumental assistance and financial support. Our final model adjusted for differences in parents' education and income, as

rural parents and their adult children were likely to have lower SES, which may consequently impact both the support they received and their health.[3]

In supplemental analyses, we explored whether either proximity to or support from adult children is more important for the health of rural compared to urban parents by including interaction terms between metro status and proximity, instrumental support, and financial assistance. Since none of these interactions were significant, we do not present them, but they are available upon request.

RESULTS

Descriptive Statistics by Metro Status

Tables 1 and 2 provide descriptive characteristics of adult children and parents by metro status, respectively. The average age of parents is 63, reflecting their relatively "young old" age distribution, whereas the average age of adult children is 37. Nearly one in five parents lives in a rural county. Our sample reflects known demographic and SES differences by metro status. A higher proportion of rural than urban parents are white. Adult children of rural parents are more likely to be in a union and have slightly more adult siblings, reflecting higher fertility among rural parents. There are also striking differences in SES, with both rural parents and their adult children reporting significantly lower income and educational attainment.

These tables also show sizable differences in intergenerational proximity by parental metro status. Children of urban parents are both more likely to live with or live within 30 miles of their parents compared to children of rural parents (Table 1). In contrast, adult children of rural parents are twice as likely as their urban counterparts to live 30 to 200 miles from their parents and are more likely to live 200 or more miles from their parents. A similar pattern persists in our measure of distance to the nearest child, except that differences in co-residence are even more pronounced, while differences in distances of less than 30 miles (but not co-residing) become insignificant (Table 2). Although children of rural parents are less likely to live nearby, they are significantly more likely to help with household chores, errands, and hands-on care in the last year than children of urban parents. In contrast, rural parents are less likely than urban parents to receive financial assistance from their adult children. A mere 3.1 percent of adult children of rural parents give any financial support above $200 compared to 5.9 percent for urban parents.

Table 1: Descriptive Characteristics of Adult Children by Metro Status

	Total	Urban	Rural	P-value
n	*10,264*	*8,164*	*2,100*	
Demographic characteristics				
Age (%)				0.096
<30	28.9	30.0	24.5	
30-39	32.3	32.1	33.1	
40-49	23.8	22.9	27.1	
>=50	15.0	15.0	15.3	
Male (%)	49.9	50.2	48.5	0.389
Married or cohabiting (%)	49.7	48.3	55.2	0.001
Adult siblings (mean)	3.5	3.4	3.7	0.079
Socioeconomic status				
Education (%)				0.002
Less than high school	3.2	3.2	3.6	
Completed high school	17.8	16.9	21.6	
Some college	17.7	17.7	17.3	
Completed college	15.6	16.4	12.4	
More than college	10.6	11.2	8.2	
Missing	35.0	34.5	37.0	
Income (%)				0.003
< $25,000	9.2	8.7	11.1	
$25,000 to <$50,000	13.5	13.0	15.6	
$50,000 to <$75,000	12.9	12.9	12.6	
>=$75,000	34.3	35.8	28.4	
Missing	30.1	29.6	32.3	
Proximity and Support				
Proximity of this child (%)				<0.001
Co-reside		12.9	7.0	
<30 miles		47.1	40.7	
30 to <200 miles		14.5	30.6	
200 to <500 miles		8.8	8.0	
>=500 miles		16.7	13.8	
Help provided by this child (%)	16.0	15.1	19.5	0.017
Money provided by this child (%)	5.3	5.9	3.1	0.003

P-Value of Pearson's Chi-squared Test for categorical variables and T-Tests for continuous variable.
All estimates are weighted and clustered at the family level.

Table 2: Descriptive Characteristics of Parents by Metro Status

	Total	Urban	Rural	P-value
n	*3,742*	*3,008*	*734*	
Demographic characteristics				
Age (%)				0.880
50-59	43.3	43.4	43.0	
60-69	33.2	33.0	34.5	
70-79	15.6	15.6	15.6	
80+	7.8	8.0	7.0	
Race (%)				<0.001
White	83.7	81.5	92.9	
Black	10.0	11.0	6.0	
Other	6.3	7.5	1.1	
Male (%)	45.7	45.7	45.7	0.980
Married or cohabiting (%)	72.7	72.7	72.9	0.941
Socioeconomic status				
Education (%)				<0.001
Less than high school	10.1	9.7	11.8	
Completed high school	34.7	32.3	44.6	
Some college	23.1	23.1	23.0	
Completed college	16.9	18.3	11.0	
More than college	15.3	16.6	9.6	
Income (%)				<0.001
< $25,000	16.2	14.9	21.6	
$25,000 to <$50,000	20.5	19.3	25.8	
$50,000 to <$75,000	17.5	17.9	20.0	
>=$75,000	45.8	49.0	32.7	
Missing				
Proximity and Support				
Proximity of nearest child (%)				<0.001
Co-reside	24.6	26.7	15.9	
<30 miles	54.0	53.7	55.3	
30 to <200 miles	10.9	8.6	20.6	
200 to <500 miles	4.7	5.1	3.1	
>=500 miles	5.8	6.0	5.1	
Help from children (%)	26.7	25.2	32.9	0.003
Money from children (%)	11.7	12.5	8.3	0.022
Parental Health				
Poor Health in 2013 (%)	20.8	20.8	20.7	0.940
Poor Health in 2017 (%)	25.3	24.6	28.0	0.138
Functional Limitation in 2013 (%)	28.0	27.2	31.2	0.080
Functional Limitation in 2017 (%)	34.1	32.8	39.4	0.007

P-value of Pearson's Chi-squared Test for categorical variables.
All estimates are weighted and clustered at the family level.

More than a fifth of parents described their overall health as poor in 2013. This proportion increases to over a quarter by 2017. Although rural parents are slightly more likely than urban parents to report poor health in 2017, these differences are not statistically significant. Rural parents are more likely than urban parents to report having a functional limitation, and the rural disadvantage increases between 2013 and 2017.

Rurality and Adult Children's Support

Turning to our multivariate analyses, Table 3 presents odds ratios for a parent receiving instrumental assistance from each of their adult children, controlling for demographic characteristics. Contrary to our expectations in H1a, Model 1 shows that rural parents are significantly *more* likely to receive such assistance. Children of rural parents have 55 percent higher odds of providing instrumental assistance than children of urban parents. Model 2 shows that children who live close to their parents are substantially more likely to provide instrumental assistance than children living further away. After adjusting for proximity, the odds ratio for rural increases from 1.55 (Model 1) to 1.75 (Model 2) (H1b), suggesting that greater distances between rural parents and their children may reduce how much instrumental support they receive.

Model 3 includes measures of parental health and limitations in 2013. Parents who reported a physical limitation in 2013 are significantly more likely than those with no limitations to receive help from their adult children. However, parents who report being in poor health are not significantly more likely to receive instrumental support after adjusting for functional limitations, suggesting that instrumental assistance from adult children may be given specifically to compensate for parents' limited abilities rather than their health status more generally. Adjusting for differences in parental limitations does not substantially alter metro status differences in instrumental assistance. Similarly, Model 4 shows that metro status differences persist even after adjusting for both parents' and children's income and educational attainment.

Table 4 presents analogous models for whether parents receive financial assistance from adult children. Consistent with H1a, Model 1 shows that even after adjusting for demographic characteristics, the odds of receiving financial assistance from adult children are only about half for rural than for urban parents. Adjusting for proximity has little effect on the metro status coefficient (H1b) (Model 2). Unlike instrumental assistance, financial assistance does not decline monotonically as intergenerational

Table 3: Instrumental Assistance from Adult Children (N=10,264)

	(1) OR	(2) OR	(3) OR	(4) OR	(95% CI)
Parent Characteristics					
Rural residence	1.55**	1.75***	1.71***	1.76***	(1.34 - 2.31)
Poor health 2013			1.15	1.23	(0.93 - 1.64)
Limitation 2013			1.48**	1.48**	(1.14 - 1.91)
Education (r=<HS)					
High School				1.33	(0.93 - 1.92)
Some College				1.34	(0.91 - 1.99)
Completed College				1.34	(0.86 - 2.10)
More than College				1.73*	(1.10 - 2.73)
Income (r=<$25,000)					
$25,000 to <$50,000				0.98	(0.70 - 1.38)
$50,000 to <$75,000				0.73	(0.48 - 1.12)
>=$75,000				0.74	(0.50 - 1.10)
Child Characteristics					
Proximity (r=co-reside)					
<30 miles		0.48***	0.48***	0.48***	(0.36 - 0.64)
30 to <200 miles		0.23***	0.23***	0.21***	(0.14 - 0.31)
200 to <500 miles		0.12***	0.12***	0.12***	(0.07 - 0.20)
>=500 miles		0.08***	0.08***	0.08***	(0.05 - 0.12)
Education (r=<HS)					
High School				1.14	(0.74 - 1.77)
Some College				1.19	(0.75 - 1.89)
Completed College				1.56+	(0.96 - 2.52)
More than College				1.15	(0.67 - 1.99)
Missing				2.24**	(1.27 - 3.95)
Income (r=<$25,000)					
$25,000 to <$50,000				1.01	(0.70 - 1.44)
$50,000 to <$75,000				1.53*	(1.07 - 2.19)
>=$75,000				1.16	(0.82 - 1.64)
Missing				0.38***	(0.23 - 0.64)
Constant	0.66*	1.24	1.09	0.58	(0.30 - 1.12)

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10. All models are weighted and clustered at the family level and control for demographic factors of parents (age, gender, race/ethnicity, union status) and adult children (age, gender, union status, number of adult siblings).

distance increases. Children living in moderate proximity (between 30 and 200 miles) are the least likely to provide financial support. Also, in contrast to instrumental assistance, financial support does not appear to be associated with either parents' overall health or their functional limitations at baseline (Model 3). Finally, controlling for SES does not impact the magnitude of the metro status coefficient (Model 4). These findings

Table 4: Financial Assistance from Adult Children (N=10,264)

	(1) OR	(2) OR	(3) OR	(4) OR	(95% CI)
Parent Characteristics					
Rural residence	0.55*	0.56*	0.56*	0.59*	(0.37 - 0.95)
Poor health 2013			1.10	1.10	(0.68 - 1.76)
Limitation 2013			1.16	1.16	(0.77 - 1.74)
Education (r=<HS)					
High School				0.86	(0.52 - 1.42)
Some College				1.19	(0.67 - 2.10)
Completed College				1.15	(0.62 - 2.13)
More than College				1.15	(0.59 - 2.26)
Income (r=<$25,000)					
$25,000 to <$50,000				0.61+	(0.37 - 1.00)
$50,000 to <$75,000				0.71	(0.39 - 1.29)
>=$75,000				0.53*	(0.31 - 0.92)
Child Characteristics					
Proximity (r=co-reside)					
<30 miles		0.75	0.75	0.67	(0.41 - 1.08)
30 to <200 miles		0.68	0.68	0.54+	(0.29 - 1.01)
200 to <500 miles		0.47*	0.47*	0.37**	(0.18 - 0.76)
>=500 miles		1.05	1.06	0.85	(0.46 - 1.56)
Education (r=<HS)					
High School				0.48	(0.16 - 1.50)
Some College				0.81	(0.26 - 2.53)
Completed College				1.13	(0.33 - 3.88)
More than College				1.10	(0.32 - 3.81)
Missing				0.84	(0.28 - 2.48)
Income (r=<$25,000)					
$25,000 to <$50,000				1.30	(0.70 - 2.39)
$50,000 to <$75,000				1.60	(0.84 - 3.05)
>=$75,000				2.15*	(1.13 - 4.11)
Missing				1.88	(0.80 - 4.40)
Constant	0.12***	0.14***	0.13***	0.15***	(0.05 - 0.42)

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10. All models are weighted and clustered at the family level and control for demographic factors of parents (age, gender, race/ethnicity, union status) and adult children (age, gender, union status, number of adult siblings).

suggest that rural and urban differences in proximity, health, and SES cannot account for the lower levels of financial support rural parents receive relative to their urban counterparts.

Supplemental analyses (Appendix A) provide evidence that our results are not likely due to reverse causality. Although prior parental functional limitations (from 2009) are more strongly associated with

instrumental assistance than functional limitations in 2013, including the 2009 measures of health and limitations does not diminish the differences by metro status (Model 1). Our results for financial assistance are similarly unaffected by adjusting for 2009 prior health measures (Model 2 of Appendix A).

Rurality and Health Conditions among Parents

Our next set of analyses explore metro status differences in health conditions. Table 5 presents odds ratios for parents reporting poor health status in 2017. Despite small differences in overall health across metro status (Table 2), once we control for demographic measures, particularly race and prior health in 2013, the odds of reporting poor health are 35 percent higher for rural than for urban parents (H2a). Not surprisingly, there are very strong correlations between parental health status in 2013 and their health four years later.

Although rural parents live further from their adult children, are more likely to receive instrumental assistance, and less likely to receive financial support, the odds ratios for metro status remain similar across Models 1, 2, and 3 (H2b). This is likely because neither proximity (Model 2) nor support from adult children (Model 3) is associated with subsequent parental health. After adjusting for parental SES (Model 4), metro status differences in parental health are no longer significant, suggesting that lower parental education and income are more important contributors to rural-urban health disparities than proximity to and support from adult children.

Table 6 shows similar findings with respect to parents' functional limitations in 2017. The odds of having a functional limitation are 36 percent higher among rural parents than urban parents after adjusting for parents' demographic characteristics and limitation status in 2013 (Model 1) (H2a). Neither proximity to adult children (Model 2) nor financial support (Model 3) is associated with reporting a functional limitation in 2017. However, a significant *positive* association between receiving help from adult children and having a functional limitation remains, even after controlling for prior limitations (Model 3). Nonetheless, the higher odds of limitations for parents in rural areas is fairly constant across Models 1, 2, and 3 (H2b). As with poor health, Model 4, which controls for parental education and income, indicates that metro status differences in functional limitations are largely due to their lower rural SES.

Table 5: Parental Poor Health in 2017 (N=3,742)

	(1)	(2)	(3)		(4)
	OR	OR	OR	OR	(95% CI)
Parent Characteristics					
Rural residence	1.35*	1.39*	1.38*	1.12	(0.85 - 1.48)
Poor health 2013	15.56***	15.74***	15.70***	13.30***	(10.42 - 16.98)
Proximity (r=co-reside)					
<30 miles		0.93	0.95	0.97	(0.73 - 1.28)
30 to <200 miles		0.82	0.84	0.92	(0.59 - 1.44)
200 to <500 miles		1.11	1.14	1.30	(0.69 - 2.45)
>=500 miles		1.45	1.50+	1.65*	(1.02 - 2.68)
Help from children			1.12	1.17	(0.90 - 1.52)
Money from children			1.01	0.99	(0.70 - 1.41)
Education (r=<HS)					
High school				0.70+	(0.48 - 1.02)
Some college				0.68+	(0.44 - 1.03)
Completed college				0.49**	(0.31 - 0.79)
More than college				0.46**	(0.28 - 0.76)
Income (r=<$25,000)					
$25,000 to <$50,000				0.84	(0.57 - 1.23)
$50,000 to <$75,000				0.66+	(0.43 - 1.01)
>=$75,000				0.40***	(0.27 - 0.62)
Constant	0.14***	0.14***	0.14***	0.29***	(0.17 - 0.49)

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10
All models are weighted and clustered at the family level. All models also control for the demographic characteristics of parents (age, gender race/ethnicity, union status).

DISCUSSION

This study used two waves of data (2013 and 2017) from the Panel Study of Income Dynamics (PSID) to investigate rural-urban differences in instrumental and financial support received from adult children and in parental health. Our study contributes to the existing literatures on rural-urban differences in intergenerational support and older adult health in several ways. We closely examined the role of physical distance (proximity) using a nuanced categorical measure of distance, provided the first known estimates of differences in financial and instrumental support for parents by metro status, and explored the relative importance of proximity and support in explaining metro status differences in parental health outcomes.

Table 6: Parental Functional Limitation in 2017 (N=3,742)

	(1) OR	(2) OR	(3) OR	OR	(4) (95% CI)
Parent Characteristics					
Rural residence	1.36*	1.40*	1.37*	1.18	(0.91 - 1.54)
Limitation 2013	14.87***	14.93***	14.73***	13.53***	(10.80 - 16.96)
Proximity (r=co-reside)					
<30 miles		1.04	1.09	1.12	(0.86 - 1.45)
30 to <200 miles		0.86	0.93	1.00	(0.66 - 1.52)
200 to <500 miles		1.51+	1.64*	1.82*	(1.10 - 3.00)
>=500 miles		1.09	1.18	1.28	(0.80 - 2.04)
Help from children			1.31*	1.36*	(1.06 - 1.75)
Money from children			1.15	1.16	(0.82 - 1.62)
Education (r=<HS)					
High school				0.74+	(0.52 - 1.05)
Some college				0.63*	(0.43 - 0.93)
Completed college				0.51**	(0.34 - 0.77)
More than college				0.57*	(0.37 - 0.89)
Income (r=<$25,000)					
$25,000 to <$50,000				0.79	(0.54 - 1.15)
$50,000 to <$75,000				0.94	(0.63 - 1.39)
>=$75,000				0.52**	(0.35 - 0.77)
Constant	0.22***	0.22***	0.19***	0.35***	(0.21 - 0.56)

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

All models are weighted and clustered at the family level. All models also control for the demographic characteristics of parents (age, gender race/ethnicity, union status).

Our analyses yielded a few surprises and novel insights. First, consistent with previous studies which used a dichotomous indicator of distance, we find that rural parents are less likely to have an adult child living nearby (within 30 miles) than urban parents. Our categorical measure of distance, however, revealed a more nuanced relationship. We find that urban parents are especially more likely than their rural peers to co-reside with an adult child. Adult children of rural parents are twice as likely as adult children of urban parents to live a moderate distance away (between 30 and 200 miles), but not more likely to live 200 or more miles away. These findings should caution researchers against using simple dichotomous measures of living “nearby” or linear measures of distance. They highlight the need to consider how the concept of “distance” or “living nearby” may differ in rural and urban areas. Structural factors, such as the availability of affordable housing, driving behaviors, or location of airports

may strongly shape patterns of intergenerational proximity, but are rarely considered when assessing the availability of kin support for aging adults. We also note that greater distance does not necessarily equate to longer transportation times, as highways allow for faster travel than congested city roads, and flying significantly shortens long-distance travel.

Second, consistent with our first hypothesis, we find rural parents are less likely than urban parents to receive financial support but are *more* likely to receive instrumental support. Despite a roughly 12 percentage point difference in the likelihood that an adult child lives nearby, the odds of receiving instrumental assistance from their children are more than 50 percent higher for rural than for urban parents. This finding demonstrates that although proximity is likely correlated with support, it is not synonymous, as some adult children living nearby may offer no support, while others may provide substantial support despite greater physical distances. Further, because most of this support, including running errands, giving rides, and providing hands-on care, requires in-person contact, these findings suggest that this greater instrumental support requires rural children to travel further. Traveling longer distances may mean larger financial and time burdens on adult children of rural parents. Yet, family and health policies rarely consider such additional costs. Nor is it widely recognized that adult children of rural parents shoulder a larger burden of the instrumental care for their aging parents (Rhubart et al. 2021), even as there is growing recognition of the importance of unpaid work provided by family members.

Third, we find that controlling for intergenerational proximity actually increases the odds that a rural parent receives instrumental support (H1b), suggesting that greater intergenerational distances limit the instrumental help rural parents receive. In contrast, greater distance does not explain why rural parents are less likely than urban parents to receive monetary assistance (H1b). Notably, metro status differences in either instrumental or financial support persist after controlling for SES, despite much lower incomes among adult children of rural parents. The persistence of these rural-urban gaps in support suggests that other factors, such as cultural norms or access to services, may be important. Unfortunately, PSID does not have measures of beliefs regarding filial obligations or attitudes about accepting financial help, particularly from one’s children. It is plausible that rural norms governing caring for others extends to adult child and parent relationships (Hofferth and Iceland 1998). Yet, rural parents may be more willing to accept in-kind or practical assistance, rather than financial help, from their adult children. Furthermore, limited provision of private or public

services such as grocery deliveries, public transportation for doctor visits, or in-home nursing care may make instrumental care from adult children more essential for rural parents, while rendering financial support to cover these services irrelevant.

Fourth, consistent with our second main hypothesis, rural parents experience worse overall health and more functional limitations, after adjusting for demographic characteristics and prior health status (H2a). Contrary to H2b, however, neither greater intergenerational distances nor less support explain the rural health disadvantages among parents. We do not find evidence that having adult children living nearby or receiving instrumental or financial assistance from them is protective for parental health. Previous studies in Australia and Canada also suggest that the association between social support and health in rural areas is weak or not significant (Allen et al. 2012; Wanless, Mitchell, and Wister 2010). In fact, we find that receiving help from an adult child is associated with a *higher* likelihood of subsequently experiencing a functional limitation, even after controlling for prior limitations. This unexpected finding is consistent with prior studies on social support, which suggests that greater dependence on others may undermine individuals' self-efficacy and ultimately their health (Yang et al. 2020). There may also be non-causal explanations, such as health declines preceding a limitation. More research is needed to parse out such complicated processes.

The absence of evidence of a protective effect of proximity or support on parental health may also reflect the relatively short time interval or limitations in the health measures themselves. Parental health worsened only slightly over the four years of our study. Hence, it would be premature to conclude that greater distances and limited support do not contribute to poorer overall health over a longer period such as ten or twenty years. Additionally, although supplemental analyses demonstrated that the results were robust to model and measure specifications, there may be other dimensions of health that are sensitive to proximity and support. Ultimately, however, our findings should help alleviate concerns that age-specific internal migration patterns are leaving middle-aged and older rural adults cut off from the support and care of their adult children and, therefore, at risk of worse health outcomes. Instead, they suggest that other factors, specifically structural and economic inequalities, underlie the declining health of rural parents.

Limitations

To our knowledge, our study is the first to examine rural-urban differences in support from adult children and its implications for parental health outcomes in the U.S. Our focus on metro status of parents, intergenerational proximity, and two types of support, unfortunately, precluded us from more in-depth exploration of other key characteristics such as gender, race/ethnicity, union status, geographic region, and rurality of adult children. Further, the PSID is one of only a few nationally representative longitudinal studies that includes data on intergenerational support and parental health. Nonetheless, both parental health and support were self-reported and, thus, are subject to both measurement error and bias. For example, there are known discrepancies in how parents and their children reported intergenerational transfers (Cheng et al. 2013; Lin and Wu 2018). Because we are interested in parental health, we used parents' reports of receiving support, which may be subject to recall bias. Unlike other longitudinal surveys, PSID also has a reasonably large sample of respondents living in rural counties. Nonetheless, sample size limitations prohibited us from measuring rurality along a continuum rather than as a dichotomous variable. Furthermore, we relied on the OMB county classification of metro and nonmetro counties, which despite being widely used in the literature, does not account for within-county variation in rurality. PSID's comparatively small sample of older adults required us to include parents aged 50 or older. Studies which focus exclusively on an older adult population may yield different (and potentially stronger) results, as ADLs and other serious health conditions typically develop after the age of 65. Additionally, older adults will have older children, which may shape the availability and needs for support among both children and parents. In contrast, studies on middle-aged parents found that young adults primarily provided emotional support (Cheng et al. 2013). Hence, the relationships between support and parental health likely changes as parents age.

As highlighted in our conceptual framework, the bidirectional relationship between adult children's support and parental health presents methodological challenges. Our analyses of instrumental and financial support rely on cross-sectional data from 2013. Sensitivity analyses showed a slightly stronger positive association between parental health in 2009 than in 2013, providing some evidence of reverse causality. However, adjusting for health status in 2009 rather than in 2013 did not appear to bias our estimate of the effect of metro status. For our analyses of parental health outcomes in 2017, we controlled for prior health status

in 2013 to establish the chronological order and mitigate some (although not all) of the potential reverse causality bias. Nonetheless, as noted above, our period of observation was relatively short and lagged variables do not fully account for endogeneity. In fact, enduring endogeneity may be responsible for the positive association between instrumental help and functional limitations found in Table 6.

Lastly, mortality, institutionalized care, and other factors may influence sample attrition and, hence, may shape our sample of middle-aged and older adults participating in both 2013 and 2017 waves. Sensitivity analyses including all parents interviewed in 2013 (even if they were not interviewed in 2017) yielded similar findings for our models of support from adult children. Nonetheless, to the extent that rural residence and kin support are related to attrition and mortality in all PSID waves, this may bias our findings. Finally, in principle, PSID includes respondents who are in assisted living facilities, but less than 0.5 percent of our sample was in such a facility, which may be under-representative of the U.S. population.

CONCLUSIONS

Rural populations are aging more rapidly than urban populations and perform worse across multiple health outcomes. We find that older rural adults are more likely to live further from one of their most critical sources of care, adult children. Rural parents are also less likely to receive financial support from their adult children. In contrast, children of rural parents offer significantly more instrumental help than children of urban parents, suggesting they are both willing and able to overcome the greater physical distance. Unfortunately, these efforts are not sufficient to counter the broader social, economic, and structural factors that adversely affect the health of middle-aged and older rural residents. Research seeking to understand the factors that shape rural-urban health disparities among older adults should pursue new, innovative ways of understanding and reflecting rural life beyond physical distance. As the proportion of older rural residents increases, additional studies examining the joint geographic and social influences on the care of older adults will be crucial in identifying the circumstances that best support healthy aging. Incorporating both spatial and social considerations across rural and urban locations is likely to spur new knowledge of the processes shaping rural-urban health disparities in older adults (Jensen et al. 2020).

ENDNOTES

[1] We do not rely on the PSID publicly available 2013 metro and non-metro variable as this variable is based on the 1983 Rural Urban Continuum Code and, hence, does not reflect population changes since the 1980 Census.

[2] Most parents classified as "other" report being Hispanic, but this category also includes a small number of Asians and other racial/ethnic groups. Small group sizes prevent disaggregation.

[3] Due to space constraints, confidence intervals are provided for our final models only in Tables 3 to 6. Confidence intervals for all other models are available upon request.

HUMAN SUBJECTS APPROVAL STATEMENT

This study was approved by the McGill University Institution Review Board.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

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Appendix A: Instrumental and Financial Support from Adult Children, Controlling for Parental Health Conditions in 2009, Odds Ratios (N=9,990)

	Model 1 Instrumental	Model 2 Financial
Parent's Characteristics		
Demographic controls	Yes	Yes
Rural residence	1.78***	0.57*
Proximity (ref=co-reside)		
<30 miles	0.47***	0.75
30 to <200 miles	0.23***	0.68
200 to <500 miles	0.12***	0.48*
500 miles or more	0.07***	1.06
Poor health 2009	0.93	0.85
Limitation 2009	1.72***	1.17
Child's Characteristics		
Demographic controls	Yes	Yes

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

All models are weighted and clustered at the family level. Parental demographic controls include age, race/ethnicity, gender, union status; adult child demographic controls include age, gender, union status, number of adult siblings.