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Cross-Sectoral Partnerships By Area Agencies On Aging: Associations With Health Care Use And Spending

ABSTRACT Area Agencies on Aging (AAAs)—which coordinate social services for older adults in communities across the US—regularly address social determinants of health, sometimes in partnership with other social services and health care organizations. Using data from a 2013 national survey of these agencies, we examined whether their partnership activities were associated with 2014 levels of avoidable health care use and spending for older adults in counties served by each AAA. Multivariate regression models adjusted for agency characteristics, county demographic characteristics, and health care supply factors. We found that counties whose AAAs maintained informal partnerships with a broad range of organizations in health care and other sectors had significantly lower hospital readmission rates, compared to counties whose AAAs had informal partnerships with fewer types of organizations. Counties whose AAAs had programs to divert older adults from nursing home placement had significantly lower avoidable nursing home use, compared to counties whose AAAs lacked such programs. Our findings suggest that AAAs may be a promising source of leadership for cross-sectoral partnerships that effectively address both social and medical determinants of health for older adults, who account for a substantial share of overall health care spending.

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Estimates suggest that 40–90 percent of poor health is attributable to social, behavioral, and economic factors[1]—domains that have historically fallen outside the purview of the health care system. For older adults, growing evidence indicates that social services, such as housing support,[2–5] nutrition assistance,[6,7] and income support,[8] can improve health and reduce the need for costly medical care. Together with evidence that greater investment in social services at the state and county levels is linked to better health outcomes,[9,10] these findings present a compelling case for engaging social services providers in efforts to improve the health of older adults and contain the growth of health care spending.

Cross-sector partnerships have been identified as a promising approach to establishing local systems that are aligned to meet the interrelated social and medical needs of a population.[11] Recent evidence suggests that communities with lower health care use and spending for older adults tend to be characterized by more robust collaboration across organizations in the health care and social services sectors,[12,13] which is consistent with previous findings that robust multisector collaborations contribute to mortality reduction.[14] Reviews of the literature on cross-sectoral partnerships in health have identified factors thought to contribute to success, including a clear vision, adequate financial support,

and leadership processes that distribute authority across collaborators.[11,15] Existing evidence is limited, however, in providing detailed insights into the role of non–health care organizations in collaborations and in linking cross-sectoral collaborations to a range of health outcomes.[11] Although Area Agencies on Aging (AAAs) regularly anchor interorganizational partnerships that target the needs of older adults, to our knowledge no prior study has examined whether AAA partnership activities influence health outcomes for older adults.

Accordingly, our study sought to examine whether agencies' involvement in cross-sector collaborations was associated with reductions in potentially avoidable health care use and spending among older adults in the AAAs' Planning and Service Areas. There are more than 600 agencies known as AAAs, established under the Older Americans Comprehensive Services Amendments of 1973. These agencies have historically funded, provided, and coordinated a range of independence-enhancing services for older adults such as in-home care, case management, home-delivered meals, transportation, and the prevention of elder abuse and neglect. In some areas, AAAs partner with hospitals and insurers to link social services with older adults identified by health care providers as particularly vulnerable, including those with recent hospitalizations or nursing home stays and enrollees in Medicaid managed care programs.[16] The 622 AAAs belong to a national network known as the National Association of Area Agencies on Aging (n4a).[17] The nationwide reach of the network means that scaling up effective strategies through it could deliver substantial health improvements.

Study Data And Methods

STUDY DESIGN AND SAMPLE We conducted a retrospective cross-sectional study using data from a survey of AAAs[16] and measures of avoidable health care use and spending for the older adults they covered. The National Aging Network, which includes federal and state agencies on aging as well as local AAAs, covers the entire US, although eight smaller or sparsely populated states have only State Units on Aging and lack AAAs that offer and coordinate services at the local level. These eight states were not included in the survey of AAAs. In the remaining forty-two states and the District of Columbia, each AAA covers a designated Planning and Service Area, which is usually defined as a collection of counties (median: 5.7 counties per AAA; interquartile range: 2.3–9.5). We excluded from our analysis counties that were served by two or more AAAs

because our data on outcomes and covariates could not be accurately matched to subdivisions of counties. Thus, 1,916 counties, covered by 368 AAAs, were eligible for our study. Data were available on dependent variables and covariates for 1,110–1,560 counties, collectively containing 48–53 percent of the US population.

DATA AND MEASURES

▶ **DEPENDENT VARIABLES:** We obtained county-level data on three measures of avoidable health care use and spending for 2014, the year after the AAA survey. The first measure was all-cause risk-stratified hospital readmission rates (RSRRs).[18] Readmissions are more common for patients with unmet social needs[19] and might in some cases be avoided by better collaboration among providers of health care and social services.[20] For counties with multiple hospitals, we used the median RSRR of hospitals in the county, weighted by hospital admissions.

The second measure was the percentage of nursing home residents in each county who had low-care status[21,22]—that is, those residents who were relatively high functioning and did not require extensive physical assistance. Low-care status is used to identify unnecessary nursing home placements that could have been prevented through stronger coordination of services to meet in-home care needs.

The third measure was total Medicare spending per beneficiary. This measure was selected to provide a global assessment of health care use, adjusted for age, sex, race, and regional price differences.[23]

▶ **INDEPENDENT VARIABLES:** We obtained data on the extent to which AAAs partnered with other social services and health care agencies in their regions from the National Aging Network Survey of Area Agencies on Aging,[16] which was administered to 613 AAAs in 2013 (63 percent response rate) by the National Association of Area Agencies on Aging in partnership with the Scripps Gerontology Center at Miami University of Ohio. Responding AAAs indicated whether they partnered with each of twenty-five different types of social service and health care organizations. Agencies were asked to specify whether these partnerships were informal (noncontractual) or formal (governed by a contract or memorandum of agreement). They could record both informal and formal partnerships with a single type of organization, and they were asked to exclude relationships that consisted solely of referrals. We calculated the number of organization types with which each AAA reported having informal and formal partnerships, respectively, to obtain two measures of the breadth of each AAA's partnership network. We also calculated the proportions of informal and formal partners

that provided health-related services. In the survey, AAAs also reported whether they had three specific types of programs that involved partnering with health care organizations: programs that divert people from nursing home placement, those that facilitate transitions out of institutional care, and those that support care transitions.

▶ COVARIATES: From the AAA survey, we obtained data on each agency's organizational structure and annual budget. We calculated the ratio of each agency's annual budget to the total population age sixty and older in counties within the AAA's Planning and Service Area. Other county-level covariates included urban or rural location, county demographic characteristics (income, race, and education), social capital, health care supply (hospital and nursing home beds per 1,000 people), and use of preventive care (percentage of Medicare beneficiaries with at least one annual visit to a primary care provider). (Additional details about variables and data sources are in the online appendix.)[24]

ANALYSIS We calculated standard descriptive statistics to summarize characteristics of the AAAs and counties in our sample. After performing bivariate analyses, we fit separate multivariate regression models to estimate associations between AAA partnership activities reported in 2013 and our three county-level measures of avoidable health care use and spending for 2014. To account for the clustered structure of our data, in which multiple counties are served by the same AAA, all models clustered standard errors by AAA.

AAA programs that involved partnering with health care organizations were included in models for outcomes conceptually related to those programs. All multivariate models were adjusted for the covariates listed above: AAA characteristics, urban or rural location, county demographic characteristics, social capital, preventive care use, and health care supply factors that were conceptually related to the outcome being modeled (nursing home beds per resident for low-care nursing home use, hospital beds per resident for Medicare spending, and both for RSRR).

Analyses were performed with SAS, version 9.4. Sensitivity analyses are described in the appendix.[24]

LIMITATIONS Our results should be interpreted in light of the study's limitations. First, this was a cross-sectional analysis, so we could not infer causation. However, we included a variety of covariates in our models to adjust for other factors known to influence the dependent variables.

Second, missing data for certain variables reduced the number of observations available for use in our models and may therefore limit the generalizability of our findings. Still, the counties included in our models represent 48–53 percent of the US population for the three measures of avoidable health care use and spending.

Third, measurement error in reporting partnerships via the AAA survey could have affected our results. In particular, partnerships may involve organizations that serve some counties in the AAA's Planning and Service Area but not others.

Finally, data regarding the number or quality of individual organizational partnerships with the AAA were not available. We believe that the diversity of partnership types is particularly important, however, as it represents the degree of interconnection among organizations addressing different dimensions of need for older adults. Furthermore, examining the diversity of partnership types, rather than the absolute number of partners, helps ensure comparability between larger and smaller regions that would have different numbers of individual organizations as potential partners.

Study Results

AGENCY PARTNERSHIPS Counties varied widely in the breadth of partnerships maintained by their Area Agencies on Aging. The average county's agency reported informal partnerships with 10.9 types of organizations (observed range: 0–25) (exhibit 1). Informal partnerships were most frequently reported with long-term care facilities (69.1 percent), advocacy organizations (60.3 percent), and emergency preparedness agencies (57.9 percent) (exhibit 2). The average county's AAA reported formal partnerships with 5.5 types of organizations (observed range: 0–20) (exhibit 1). Formal partnerships were most frequently reported with state health insurance assistance programs (74.0 percent), Medicaid (53.2 percent), and transportation agencies (48.5 percent) (exhibit 2). The number of informal partner types reported was negatively correlated with the number of formal partner types (Pearson correlation coefficient: -0.25; $p < 0.0001$). Health care partnerships constituted 45 percent of formal partnerships and 33 percent of informal partnerships (exhibit 1).

A majority of counties had AAAs with programs to facilitate transition from institutional placements (61.8 percent) and to divert from nursing home placement (68.2 percent) (exhibit 1). Only 22.1 percent of counties had AAAs with formal care transitions programs.

ASSOCIATIONS BETWEEN PARTNERSHIPS AND COUNTY-LEVEL USE AND SPENDING In fully adjusted analyses, greater breadth of AAA informal partnership networks—measured as the number

Characteristics of US counties and the Area Agencies on Aging (AAAs) that serve them

	No. of counties in which data were available (n)	Mean or %	SD
DEPENDENT VARIABLES: USE AND SPENDING			
Readmission rates (RSRR)	1,339	15.51	0.73
Nursing home residents of low-care status	1,360	14.09%	8.16
Medicare spending per beneficiary	1,916	$9,444.98	1,346.84
ANNUAL AGENCY BUDGET			
Per person ages 60 and older	1,601	$80.46	100.35
Percent of budget from OAA	1,809	47.10%	26.42
Percent of budget from Medicaid	1,782	18.79%	23.73
Percent of budget from contracted services	1,734	47.45%	30.78
AGENCY PARTNERSHIPS			
Informal partnership types (all)	1,910	10.89	5.69
Percent of informal partnership types in health care	1,910	33%	0.15
Formal partnership types (all)	1,910	5.53	3.93
Percent of formal partnership types in health care	1,910	45%	0.26
AGENCY PROGRAMS WITH HEALTH CARE ORGANIZATIONS			
To facilitate transition from institutional placements	1,180	61.78%	—[a]
To divert from nursing home placement	1,302	68.17%	—[a]
Formal care transitions program	422	22.11%	—[a]

SOURCES Authors' analysis of data from LTCfocus, the Centers for Medicare and Medicaid Services, Dartmouth Atlas of Health Care, and the 2013 National Aging Network Survey of Area Agencies on Aging (see note 16 in text). **NOTES** "Low-care status" is defined in the text. SD is standard deviation. RSRR is risk-stratified hospital readmission rate. OAA is Older Americans Act. [a]Not applicable.

of AAA informal partnership types—was associated with lower county-level RSRR (exhibit 3). Grouping counties into quintiles based on the breadth of AAA informal partnerships indicated that being in the highest quintile of breadth (fourteen or more types of partnerships) was associated with an RSRR decrease of 0.22 percentage point ($p = 0.04$), compared with being in the lowest quintile (results are in exhibit 5 in the online appendix).[24] Being in the highest decile of AAA informal partnership breadth (eighteen or more types of organizations) was associated with an RSRR decrease of 0.46 percentage point ($p = 0.005$), relative to being in the lowest decile. This magnitude of RSRR difference is approximately the difference between a hospital that performed at the median RSRR nationally and a hospital that performed better than 75 percent of hospitals or worse than 75 percent of hospitals nationally. The breadth of formal partnerships was not associated with RSRR.

Although the breadth of AAA informal partnership networks was not significantly associated with Medicare spending per beneficiary, that of formal partnerships—measured as the number of formal partner types—was significantly associated with higher Medicare spending per beneficiary (exhibit 3). Counties in the highest quintile of AAA formal partnership breadth (ten or more types of organizations) had annual Medi-

care spending per beneficiary that was $588 higher than that of counties in the lowest quintile ($p < 0.001$) (see exhibit 5 in the online appendix).[24] The shares of formal or informal partnerships that were with health-related organizations were not significantly associated with any of the three dependent variables.
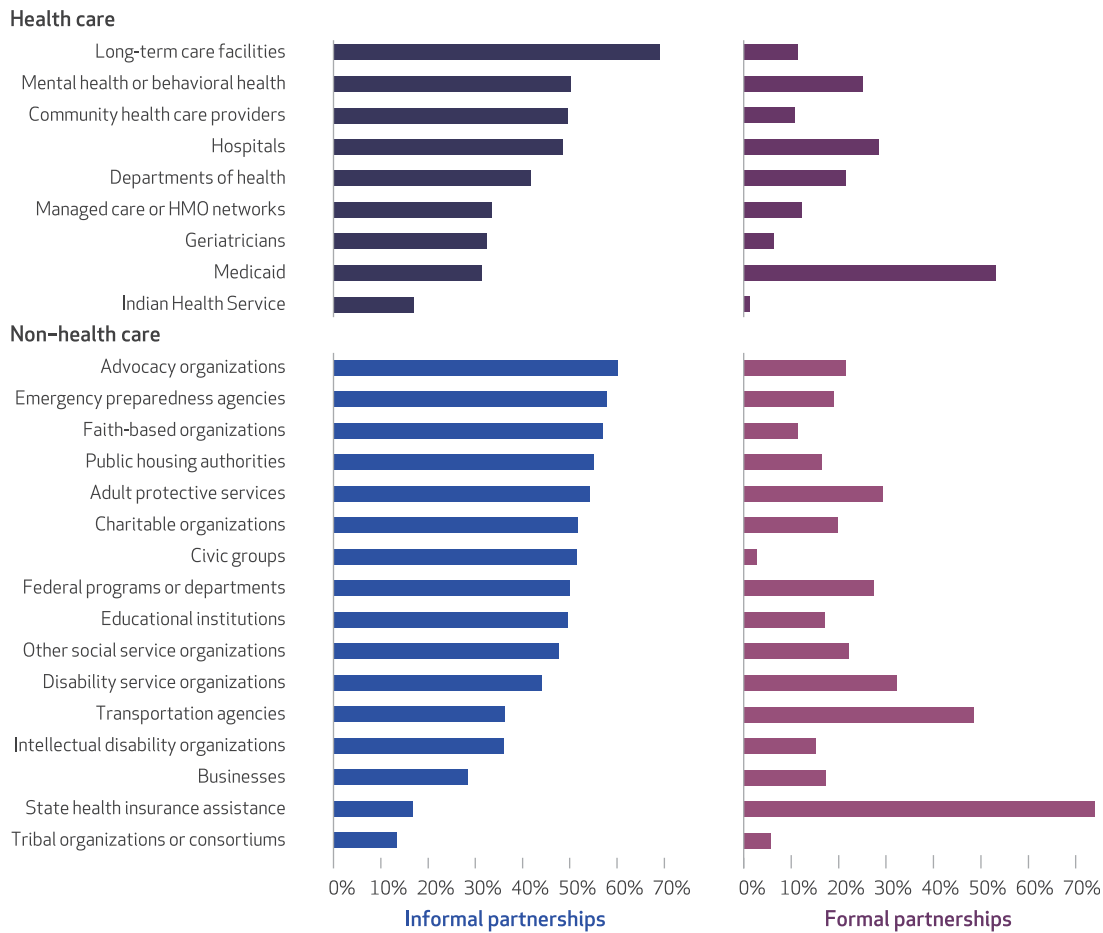
Counties served by an AAA program to divert consumers from nursing home placement had significantly lower proportions of nursing home residents with low-care status (exhibit 3). The proportion of these residents was an average of 2.93 percentage points lower in counties served by AAA programs to divert consumers from nursing home placement, compared with counties whose AAAs lacked such programs. The proportion of nursing home residents with low-care status was not associated with breadth of AAA partnership networks. (Full results of regression models are in exhibits 4 and 5 in the appendix.)[24]

Discussion

Counties whose Area Agencies on Aging maintained informal partnerships with a broad range of different types of organizations in health care and other sectors had lower hospital readmission rates. This finding suggests that cross-sectoral partnerships involving AAAs may facilitate the provision of more effective holistic

EXHIBIT 2

Percentages of Area Agencies On Aging that reported informal or formal partnerships with different types of organizations in 2013

Health care

	Informal partnerships	Formal partnerships
Long-term care facilities		
Mental health or behavioral health		
Community health care providers		
Hospitals		
Departments of health		
Managed care or HMO networks		
Geriatricians		
Medicaid		
Indian Health Service		

Non–health care

Advocacy organizations		
Emergency preparedness agencies		
Faith-based organizations		
Public housing authorities		
Adult protective services		
Charitable organizations		
Civic groups		
Federal programs or departments		
Educational institutions		
Other social service organizations		
Disability service organizations		
Transportation agencies		
Intellectual disability organizations		
Businesses		
State health insurance assistance		
Tribal organizations or consortiums		

Informal partnerships   Formal partnerships

SOURCE Authors' analysis of data from the 2013 National Aging Network Survey of Area Agencies on Aging (see note 16 in text). **NOTE** HMO is health maintenance organization.

support for older adults, preventing exacerbations of ill health that might otherwise lead to hospital readmission. In contrast, having formal partnerships with a broad range of organization types was not associated with reduced readmission rates but was associated with higher Medicare spending per beneficiary. This might not be as counterintuitive as it first seems. Informal partnerships often result from habitual collaborative work and joint priority setting, and an AAA's informal partnerships are likely to reflect norms about how organizations generally work together in its community. They are fostered by regional institutions such as coalitions that allow AAAs to coordinate with other organizations and allow those other organizations, in turn, to coordinate among themselves. Diverse informal partnerships maintained by an AAA may indicate a denser web of interconnection across organizations in the community, which

could support the handoffs needed to help patients recover after hospital discharge and avoid rehospitalization.

Although formal contractual relationships can facilitate in-depth collaboration by defining expectations and aligning financial incentives across partners, contracts imply bilateral agreements. Formal partnerships may therefore be less representative of habits of coordination among organizations in the wider community, which could explain the lack of association with readmission rates. Extensive use of formal partnerships by AAAs could also indicate regions where providers of care for older adults are more financially sophisticated, and thus more skilled at generating demand and reimbursement for their services—a phenomenon documented across a variety of health care services.[25,26] We should note that it is not possible to tell from our study whether the higher spending in coun-

Adjusted associations between partnership activities of Area Agencies on Aging (AAAs) and dependent variables

Partnership activity	Estimated coefficient		
	Rehospitalization (RSRR)	Nursing home residents with low-care status	Medicare spending per beneficiary
Number of informal partners reported by AAA	−0.01***	0.05	−2.06
Number of formal partners reported by AAA	0.00	0.03	52.50****
AAA involved in formal care transitions program	−0.02	—ᵃ	—ᵃ
AAA had program to divert consumers from nursing home placement	—ᵃ	−2.93****	—ᵃ
AAA facilitated transition of consumers from institutional placements	—ᵃ	1.05	—ᵃ

SOURCE Authors' analysis. **NOTES** The exhibit shows results of multivariate regression analysis of independent and dependent variables and covariates, with clustered standard errors for counties that share AAAs. Models for all three dependent variables (risk-stratified hospital readmission rates [RSRR], nursing home residents with low-care status, and Medicare spending per beneficiary), and nursing home residents' low-care status) were adjusted for the following covariates: log of AAA's annual budget per person ages sixty and older covered, percentage of AAA's budget from the Older Americans Act, AAA organizational structure, percentages of informal and formal partners in the health care sector, urban versus rural location, county demographic characteristics [education, household income, percentage white non-Hispanic], social capital, and percentage of Medicare enrollees with at least one annual visit to a primary care provider. The model for Medicare spending was also adjusted for hospital bed density, the model for low-care nursing home use was adjusted for nursing home bed density, and the model for RSRR was adjusted for both. ᵃNot applicable. ***$p < 0.01$ ****$p < 0.001$

ties covered by more AAA formal partnerships represents low-value care or services that provided additional benefits for additional costs. The National Long-Term Care Demonstration, for example, enhanced community services for older adults and improved patient satisfaction but increased costs.[27]

Certain formal partnerships are likely to be effective for targeted objectives, as suggested by our finding that counties with AAA programs to divert older adults from nursing home placement had lower rates of avoidable nursing home use. Previous research has found that low-care nursing home use is lower in states with higher Older Americans Act spending on home-delivered meals;[7] AAAs administer this funding. Our results provide evidence that nursing home diversion programs may be another specific agency activity that prevents unnecessary nursing home use. Characterizing the mechanisms by which these activities prevent nursing home use is an important area for further investigation.

Some health care payers and providers are expanding efforts to connect patients with social services, notably through the newly launched Accountable Health Communities Model of the Centers for Medicaid and Medicare Services. However, there is limited evidence about how to leverage existing networks of social services within communities to improve patient outcomes and avoid unneeded health care spending.

This is the first study, to our knowledge, that has related the characteristics or activities of a large sample of AAAs to health outcomes in the AAAs' Planning and Service Areas. Recent initiatives within the AAA network have sought to strengthen relationships with health care, notably through the Aging and Disability Business Institute. This program, jointly administered by the American Society on Aging and the National Association of Area Agencies on Aging, aims to improve the capacity of AAAs and other community-based organizations to collaborate with health providers and payers.[28] Our findings that AAA partnership activity is associated with county-level health care use and spending highlight the agencies as a promising potential source of leadership in convening cross-sectoral partnerships to improve health for older adults. As states shift to managed care models for long-term services and supports, AAAs may also be attractive partners for managed care organizations.

Conclusion

Our study offers novel evidence linking the types of cross-sector partnerships maintained by Area Agencies on Aging to health care use and spending. Counties whose AAAs had broader informal partnership networks had lower hospital readmission rates, while counties whose AAAs had broader formal partnership networks had higher Medicare spending per beneficiary. Counties whose AAAs had programs to divert older adults from nursing home placement had lower rates

of low-care nursing home use. As policy makers and health care providers consider using cross-sectoral partnerships to improve health and reduce the need for costly health care services, our findings have two implications. First, AAAs' partnership behavior appears to be linked to valued health outcomes for older adults, making the agencies a natural point of intervention for efforts to foster effective cross-sectoral partnerships to serve this population. Second, informal (noncontractual) and formal (contractual) partnerships may reflect different processes at the interorganizational and community levels, and therefore have different implications for service use and costs. ∎

NOTES

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24 To access the appendix, click on the Details tab of the article online.

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