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Accessible Community Transportation In Our Nation

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Assessing the Intersection between Health and Transportation

Literature Review

Funded by the Federal Transit Administration Cooperative Agreements Easter Seals Project ACTION & the National Center on Senior Transportation in partnership with the American Medical Association & LogistiCare

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Table of Contents

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Abstract

This report summarizes activities the research team completed to conduct the literature review as part of the project *Assessing the Intersection between Health and Transportation*, funded by The Federal Transit Administration cooperative agreements, Easter Seals Project ACTION in partnership with the National Center for Senior Transportation, and with in-kind contributions from LogistiCare and the American Medical Association. Findings reported here are based on a Phase 2 conduct of a literature review/summary of the literature on aging, health and transportation. The purpose of the review was to identify what can be learned about the association between people with disabilities of all ages—with a particular focus on older adults who acquire functional changes that impact mobility. We report their need and use of transportation services in the context of health through an examination of the literature. The findings are summarized and recommendations for future research and policy are offered.

Easter Seals' ESPA program and Easter Seals and the National Association of Area Agencies on Aging 's (n4a) NCST program are training and technical assistance centers that support the expansion of accessible transportation for people with disabilities of all ages and increasing transportation options for older adults. This document is disseminated in the interest of information exchange. Neither Easter Seals, n4a nor the U.S. Department of Transportation, FTA, assumes liability for its content or use thereof.

Literature Review

Methods

As in Phase 1, the purpose of this literature review was to identify what is currently known about issues encountered by older adults with respect to transportation (e.g., sources of transportation, utilization patterns, resources, barriers). The intent of the literature review in Phase 1 was to address two major questions:

1. What types of clients/patients use what types and levels of transportation by age?
2. What are the documented benefits of access and consequences of non-access, to transportation services for the use of non-emergency medical transportation (NEMT) among older adults?

The Phase 1 preliminary review provided context and insight into the findings generated from the analysis of the LogistiCare NEMT data files, and a preliminary description on the status of knowledge about particular topics. The preliminary literature review findings also provided justification for a more comprehensive review and in-depth abstracting and annotating process for Phase 2.

The purposes of the more extensive Phase 2 review were to: (1) provide an overview of the literature on the association between transportation and health among older adults in community setting (2) identify major themes and gaps in the existing literature, (3) generate review-driven manuscripts to describe the status of knowledge about particular topics, and (4) provide a summary of the gaps, strengths and weaknesses in

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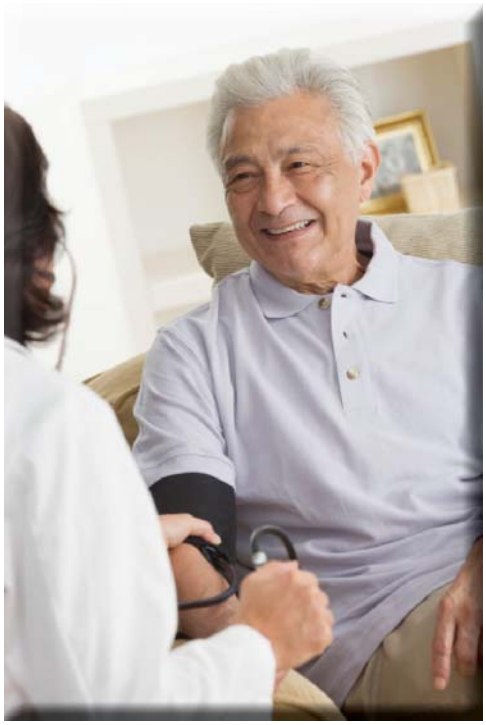

the literature and suggest directions for future research and make policy recommendations based on the findings.

The Phase 2 search focused on relevant journal articles, books, government reports, and grey literature published between **June 30, 1971 and June 30, 2011**. A variety of search terms were used within 11 distinct databases (e.g., Medline PubMed, WorldCat, Transport Database, Web of Science, Transportation Research Board, CINAHL). After identifying 265 pieces of literature pertaining to transportation use among older adults, a rubric was created to categorize/inventory the results. The information was captured in an annotation rubric which includes: (1) source of literature (journal article, book chapter, report, white paper, website, newsprint, etc.); (2) type of literature (literature review, commentary, secondary data analysis, primary quantitative, primary qualitative, etc.); (3) sample size (number of people in the study or analysis); (4) target population (sex, race/ethnicity, percent rural population, age, disability status, etc.); and (5) primary outcomes measured (the focal measure or dependent variable of the study). Efforts include further categorizing the literature within the rubric to specific content areas for in-depth abstracting. Based on Phase 1 review and findings from the analyses of the LogistiCare data, four content area topics were identified and was coded as to whether the content area was addressed in each document: The content themes included:

1. Cost of services (per ride, financial consequences to providers)
2. Diabetes (trips related to dialysis treatment)
3. Level of accompaniment (provide transportation, but also accompany on transportation)
4. Missed appointments…Consequences of missed visits
5. Urban/rural patterns in transportation use/need
6. Use/need of transportation by demographic groups(e.g., age, ethnicity, gender)

A revised set of themes emerged once the review was completed. We expanded the literature to address broader health outcomes than just those associated with access to non-emergency medical care. Studies related to transportation access to resources providing social interaction and promoting healthy lifestyles (e.g., access to healthy nutrition options, physical activity) were included. We also reviewed manuscripts pertaining to the burden and consequences by family members as a result of providing transportation to their older family members. Some

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themes proved to be far less prevalent than indicated once the review was conducted. This was particularly true for the theme of diabetes and dialysis. The number of documents on this theme proved to be far less than indicated in the search strategy. In most cases, diabetes and dialysis was noted but was not the major focus of the manuscript or diabetes was a subtopic within a larger theme. Also, in several documents the sample included a broad age range rather than just older adults. This literature was still included for review when the findings were relevant to older adults or when a sufficient proportion of the population included older adults. In such cases, we note the characteristics of the sample.

Documents were excluded in the final review if they were based in another country or region of the world where relevance to the US was questionable (e.g., China, Africa, Korea, South Pacific). We also do not review books, data sets and web sites or when the document refer to transportation tangentially or when the documents were unavailable or available at cost. Finally, when a document review addresses two or more themes, the review was included under the primary theme addressed. The reference section includes all documents identified including those excluded in the final review.

Findings

A total of 263 documents pertaining to transportation, health and aging were identified (Table 1). As can be seen from the table, the majority of the literature identified was journal articles (both peer-reviewed and non-peer reviewed articles). Another major source was books and book chapters pertaining to transportation. Almost 5% of the documents were government publications that included national, state and local transportation services relevant information, often based on a survey and findings or report and recommendations for addressing the needs and barriers to transportation services. Websites devoted to transportation are also identified and included as references. The emphasis of this review was on literature providing documentation on the association between transportation and health among older adults in the community. While this was a priority, qualitative and case studies are also included. Literature in which opinions from key informants and policy recommendation are presented were also included in the review if they provided insight on the impact of transportation on health among older adult. Finally, a proportion of the literature generated in the search was also excluded after determining that none of the information provided was relevant to the purpose of the review.

The literature were annotated by the major foci proposed in phase 1 (e.g. cost, missed appointments, etc.) and major themes identified in the findings from LogistiCare data. As can be seen in Table 1, the number and proportion of documents vary considerably by type of document with journal articles being the primary document form (81.7%). Also, the frequency of some of the specific content themes targeted for review was minimal such as transportation cost, level of accompaniment, and missed appointments. While the number of documents pertaining to age appears low, information by age group in many of these documents was not a major focus of the study/document. Finally, while the number of documents related to diabetes appears to be impressive, the actual numbers with a primary focus on diabetes was relatively low.

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Table 1

Literature Pertaining to Non-Emergency Transportation Services (n=263)		
	n	%
Source of Literature		
Book (or book section)	15	5.7%
Computerized Data (websites)	7	2.7%
Government Publication	13	4.9%
Journal Article	215	81.7%
Other	13	4.9%
Content Focus of Literature*		
Cost Per Ride	6	2.3%
Diabetes (chronic condition or treatments)	52	19.8%
Level of Accompainment	8	3.0%
Missed Appointments	10	3.8%
Rurality	38	14.4%
Age	8	3.0%
Ethnicity	38	14.4%
*Some pieces of literature contained multiple content foci		

Themes

The literature review and summary of key articles provide an opportunity to reconsider *the interaction between health and transportation* on older adults. The research has revealed the magnitude and complexity between health and wellness and transportation. Health is more than the physical health and medical consequences of older adults not receiving needed NEMT. A lack of access to appropriate transportation has consequences on the health and well-being on the older adult, restricts opportunity for engaging in health behaviors and access to social services, restricts social engagement and places considerable burden on caregivers and family members on their effort to provide transportation.

The studies reported within also provide numerous creative examples of communities and agencies experimenting with connecting the older adult to timely and appropriate resources that promote successful aging. Programs are presented demonstrating the impact of training drivers on basic safety, identification of possible mental health issues and making referral. Others have come to understand transportation and health in a broader context, one in which understands that on occasion, it is more feasible to bring health care services to the individual and transportation may also include trips to having prescriptions filled and to locations promoting healthy lifestyles such as exercise, proper nutrition and health promotion.

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The collection of articles also begins to identify patterns and factors associated with the use of transportation. While many studies show (either directly or indirectly) that a lack of transportation is a major contributor to underutilization, the articles suggest that this is more common for "apparently" less essential health care (follow-up, health screening) than more serious and essential health issues (cancer treatment). While the majority of older adults in the community are not in need of alternative transportation services, there is significant need for subgroups of older adults. Comparison across studies suggest a demographic profile of those most in need including; older, no driver in house hold, frail, and financially in need and functionally disadvantaged.

The majority of studies on cost and non-emergency medical transportation have focused on the perception of cost of the transportation limiting use of health care services and cost in terms of underutilization of services. Few studies have examined whether the cost of transportation actually influences obtaining prescribed medication among older adults.

The literature is rich in terms of identifying geographic, ethnic and cultural factors that will require attention when developing transportation resources for older adults. The isolation that often comes with a lack of mobility among older adults in general appears to be emphasized among ethnic minority groups, especially when language and cultural norms are considered. While this literature is primarily qualitative, the findings suggest that providing transportation resources will not be sufficient unless the attitudes and beliefs about transportation and language and cultural barriers are addressed. The interaction between health and transportation also present unique challenges that extend beyond distance to needed health services. Unique challenge not commonly experienced in urban setting includes insufficient street identification, unpaved and impassable roads and the closing of a hospital. Combined, these studies strongly suggest that transportation systems promotion and protecting the health of older adults must be tailored to the unique geographical and ethnic and cultural factors in the targeted settings and populations.

Finally, the very nature of the health problem and health and social resource needs of the older adult have implications on the interaction between health and transportation. Mental health is either a predictor for the need for transportation or an outcome or consequence of not having access to transportation. Additionally, findings from qualitative studies have suggested that mental health is compromised when older adults do not have accesses to community settings that promote social engagement. While there is an emerging literature on key health topics such as mental health and preventive services, there were relatively few studies focusing on critical health issues more commonly experienced by older adults such as dialysis treatment and persons with Alzheimer's Disease, that often require special transportation services.

Specific Content Areas

The individual articles reviewed and are reported below. Each review focused on only the content relevant to transportation, health and aging. Often the primary focus of the study was not transportation. The review is organized by the major content areas: A.) accompaniment/ caregiver transportation, B) missed appointments/ underutilization, C.) cost, D.) rural transportation rural/ urban contrasts, E.) mental health

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mental illness F.) health behaviors and, G) ethnic/race differences. Studies that address more than one content area were included in the primary content area addressed in the study. Also studies reviewed and determined to not be relevant were included with a brief comment and reason for exclusion.

Accompaniment/Caregiver Transportation

#29 Whitier S, Scharlach AE, Dal Santo (2005) Availability of caregiver support services: Implications for implementation of the national family caregiver support program.

This study conducted a survey of Area Agencies on Aging (AAA) service providers on their perceptions of the scope of resources and service gaps in Title IIIE caregiver services. In the area of access, the greatest gap noted was transportation with 75% of the providers identifying this as a major gap. An important additional access gap noted was a rural community service with over half reporting this as a service gap. "The lack of available transportation serves as a barrier to accessing services both for themselves as well as for those for whom they are providing care. This is especially a problem in suburban and rural areas, where services may be far apart and public transportation limited."

#139 Hanson R, Rana E (2010) Unveiling Muslim voices aging parents with disabilities and their adult children and family caregivers in the United States

An important yet often overlooked element in transportation for older adults is the role and importance of the person accompanying the rider to the medical encounter. This qualitative case study provides insight into sensitive cultural factors that may influence use of transportation by culturally diverse groups of older riders. In this case, the authors focus on older Muslim immigrants with chronic illnesses and disability and the cultural influences on their role as caregivers. This study reports several cases in which family caregiver roles influence the use of health services. Although the case studies only briefly discussed transportation accompaniment, it was noted that family caregivers were more likely to accompany a family member with a disability to medical clinic visits and participate in the health provider patient interaction. Additionally Muslim seniors are much less likely to participate in some forms of health care such as rehabilitation. They are also more likely to require that the health professional be the same gender as the older adult. There are several implications of this in terms of transportation. It is very likely that older Muslims, if they do use medical transportation services, they may extend the same gender (and religion) requirement of the person providing the transportation. The older user of transportation may be accompanied on the medical visit even if no caregiver assistance is apparently needed. This is an example of a larger concern about how transportation for medical care could better accommodate the ever increasing diversity among older riders.

#159 Leduc N, Tannenbaum TN, Bergman H, Champagne F, Clarfield AM, Kogen S (1998). Compliance of frail elderly with health services prescribed at discharge from an acute-care geriatric ward.

In one of the better designed studies that examine the role of availability of family for transportation to medical care services, Leduc and colleagues (1998) examine the contributions of available family

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transportation on compliance with recommended medical visits. Recruitment of 211 older patients from an acute care geriatrics ward who were prescribed follow-up services were followed over a 6-week period to determine compliance with recommended medical visits. Actual and intended compliance was assessed as well as extensive demographic, health status, financial barriers. Perceived benefits of the prescribed services and perceived access to transportation and assistance from family in transportation were use as predictors of compliance. Compliance or "missed appointments" depended on the type of follow-up services recommended. As might be expected, compliance to medical appointments was highest for on occasions where the health care provider came to the home (geriatric assessment home visit 98%; homemaker/nurse care 80%). However, compliance with medical care visits requiring transportation to the facility were low for clinic (65%) and family physician visits (39%). What is of particular interest was that expressed intention to comply with the medical visit and financial barriers were not significantly associated with medical appointment compliance. However, patients who perceived availability of transportation and a person to accompany them were significantly more likely to comply with recommendations for medical care follow-up. These findings suggest that a successful strategy for minimizing missed appointments should include an assessment of available transportation and availability of a person to accompany the older patient to the medical encounter. The findings also suggest that acute care discharge may be an ideal point of entry to assessing the need for and arranging non-emergency medical transportation.

#162 Leutz W, Capitman J (2008). Met needs, unmet needs, and satisfaction among social HMO members.

In one of the few studies that have examined medical transportation and non-medical transportation, older adults participating in social health maintenance organizations (SHMOs) were surveyed as to their need, unmet need and satisfaction with home and community-based services from their SHMO. A total of 800 older adult participants from four SHMOs were surveyed about help needed, informal assistance received and unmet need for 11 types of assistance (e.g., personal household maintenance, medical transportation, non–medical transportation, respite, supplies and equipment, medication management). Focusing on the transportation items, 80% of the older adults noted that they would have a problem in this area if they did not receive help from someone (67% in response to the need for non-medical transportation service). Need is considerably reduced when informal assistance is considered. Among those reporting availability of informal care assistance, less than 20% of the SHMO older adults wanted additional help with non-medical transportation while a third (33%) with informal care assistance still wanted assistance with medical transportation. These percentages increase considerably when the older adult has no informal care (48% and 77% respectively for non-medical transportation and medical transportation respectively). Finally, analyses were conducted to determine predictors of satisfaction by older SHMO participant with their health care plan. One significant finding was that participants were less satisfied if they reported inadequate help with medical transportation. These findings provide insight into the medical and non-medical transportation resources provided by family and friends as well as the critical need for non-emergency medical transportation needs among older adults with no informal care assistance.

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#194 Nasvadi G, Wister A. (2006). Informal social support and use of a specialized transportation system by chronically ill older adults.

A study from British Columbia examined the factors associated with the decision to use a handicap-specialized service (Handy Dart). The authors provide evidence that it is disability and need for informal care assistance family, rather than age of the older adult or number of comorbid illnesses that predict use of transportation services. While the generalizability of the study is limited, it suggests that use of transportation services are common for specific health issues such as arthritis and is more common in situations where family provide assistance to the older adult. The findings add to the literature on the role of informal support and family in the context of transportation.

#195 Neary MA (1993). Community services in the 1990s: Are they meeting the needs of caregivers?

Given the role of the care giver in facilitating the use of community based services for frail older adults, it is of value to understand the level of awareness of services as well as inquiry, use and satisfaction with services. Neary (1993) conducted a retrospective survey of 168 primary caregivers on their awareness, inquiry, use, and satisfaction of community based service prior to the care recipient's transition to a nursing home facility. The caregivers were presented with a list of 15 community services for older adults including assistive services (transportation, housekeeping and home delivered meals) and intensive care services (nursing and personal care assistance, respite care). There are several findings pertaining to transportation. Awareness of transportation services was high among the caregivers (83%). However, less than half of the caregiver who were aware of available transportation inquired into the service and 74% of caregivers who inquired about transportation actually used the service for their care recipient prior to nursing home placement. This suggests that it is not a lack of awareness of transportation service among caregivers that account for the low percent of eligible clients actually using the service found but rather a self-selection based on other factors. Also, when transportation services were used, it was for 2 hours per week on average and for mean duration of 26 months. The two-year mean use of transportation services was one of the most lengthy community based services used by caregivers. The mean duration of 26 months of use prior to nursing home placement is in line with finding of a 30% to 40% turnover in non-emergency medical care transportation use found in the LogistiCare data. These findings suggest two research questions; 1.) Is nursing home placement a major factor associated with disenrollment in medical transportation services and is it associated with delay in nursing home placement? 2.) If lack of awareness of transportation services on the part of the caregiver is not a major cause for the low user/ eligibility rate in transportation, what are the reasons for transportation use?

#236 Taylor BD, Tripodes S (2001) The effects of driving cessation on the elderly with dementia and their caregivers

Understanding the evolution of transportation needs among older adults is critical for estimating and predicting the need for alternative community-based transportation services and anticipating and targeting those older adults most in need for non-emergency medical transportation. This study examines change

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in mobility status among older adults who lost driving privileges due to Alzheimer's disease or related dementia. A survey was conducted with 335 caregivers of older persons who had their license revoked due to dementia (based on California DMV records). Several findings are relevant to non-emergency medical care and accompaniment. As might be expected, the loss of driving privileges resulted in increased dependence on informal caregivers for their transportation needs. There was no apparent increase in walking or use of mass transit. When asked how the former driver got to medical appointments before and after license revocation, caregivers reported an increase dependence on others for transportation primarily spouses (61%) and children (15%). Difficulties in obtaining transportation for medical trips was greater when there were no other licensed drivers in the household and when the older adult was younger and had dementia for one year or less. The authors noted that some providers of informal medical care transportation reported frequent missed work or that they stopped working in order to care for and chauffer these individuals. These findings have several implications for the true cost of transportation for older adults. The transition in transportation services follows a pattern similar to the transition in the need for physical assistance among older adults with increasing disability in performing activities of daily living (ADLs). That is, an informal caregiver will assume the role of caring for the transportation needs of the frail older adult and this role is usually assumed by a family member. Providing transportation services by informal caregivers can result in increased caregiver burden in terms of lost days of employment or lost employment. Clearly, additional research is needed on determining the extent of burden on caregivers providing transportation for their older relative.

#243 Torrez DJ (1998). Health and social service utilization patterns of Mexican American older adults

This study provides further evidence that provision of transportation to older adults can present difficulties and economic hardship on family members. Based on qualitative interviews with 46 Mexican American older adults in rural Texas, Torrez (1998) found considerable need for transportation services for health and social services. Family members who provide transportation services experience considerable economic consequences and time constraints. This study also emphasized that the need for transportation extend beyond trips to medical appointments. A respondent reported that she would not be able to "pick up my medicines (at the drugstore" if transportation were not provided. The lack of transportation for social services was also reported. These findings on the importance of transportation services for social services and the level of family burden in providing transportation for older family members are in agreement with other qualitative studies. The findings suggest a need to broaden alternative transportation options beyond traditional medical care services. There is also a need to better quantify the economic and stress burden of family members providing transportation to their older family member.

Missed Appointments/Underutilization

#32 Okoro CA, Strine TW, Young SL, Balluz LS, Mokdad AH, (2005). Access to health care among older adults and receipt of preventive services. Results from the Behavioral Risk factor Surveillance System

Quality of health care for older adults includes access to clinical preventive services. The level of access to

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specific preventive services and the barriers to access was examined in a cross-sectional study that used 2002 data from the Behavioral Risk Factor Surveillance System (BRFSS) among individuals age 65+. The study provides a national estimate of older adults who report receipt of clinical preventive services and the barriers among those who report difficulty getting needed medical care in the past 12 months. A majority (98%) of participants report being able to obtain needed medical care. Those who could not get needed medical care were more likely to report poor health, female, Black non-Hispanic, and report less than high school education. The major barriers to obtaining needed preventive health services were cost (27%), and too long to wait for an available appointment (20%). Transportation as a barrier was reported by 9% of the respondents and was significantly more prevalent among women than men (11% vs. 6% respectively). The prevalence of transportation as a barrier to needed medical care is based on a survey of the general population of older adults and the rates are likely to be higher among the population of eligible disadvantaged older adults targeted for transportation services.

#59 Blazer DG, Landerman LR, Fillenbaum G, Horner R (1995). Health service access and use among older adults in North Carolina: Urban vs. rural residents

This study uses the baseline wave of the Duke Established Populations for the Epidemiologic Studies of the Elderly (age 65+) on delay of needed medical care. A stratified random sample of 4,162 residents of one urban and four rural counties in North Carolina was conducted focusing on urban rural differences in health service use among older adults. This is one of the few studies that uses a multivariate approach on two key areas relevant to non-emergency-medical care; delay of care due to cost and delay of care due to transportation difficulties. Those who delayed medical care were asked whether they did so due to: cost, distance or transportation, or because they were "unsure where to go for help". At the bivariate level, compared to urban elderly, older adults in rural counties were more likely to put off care due to costs (24.9% vs. 4.3%) and due to transportation difficulties (5.8% vs. 9.8%). Cost was the leading reason for delaying medical care. Findings on the factors associated with putting off care due to transportation difficulties found that urban rural difference in transportation difficulties were no longer significant once demographic and health characteristics of the older respondents were controlled. The study identifies significant person level factors to transportation difficulties including Black (vs. non Black), non-married, non-employed and poor self-rating of health.

#88 Barrio C, Palinkas LA, Yamada A , Fuentes et al. (2008). Unmet needs for mental health services for Latino older adults: Perspectives from consumers, family members advocates, and service providers.

The reasons for missed appointment and underutilization may differ by ethnicity and cultural norms of older adults, particularly for treatment of mental health issues. This was suggested in a qualitative study by Barrio and colleagues (2008) in which practitioners, caregivers and older consumers of mental health services participated in semi-structured interviews and focus groups focusing on the use, need and unmet need for mental health services among older Latino adults in San Diego County. The findings were organized under two general themes, mental health services and services associated with the greater risk for mental health problems or reduced the effectiveness of mental health services. There was a consensus by all three

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stakeholder groups that language and cultural barriers contributed to underutilization and unmet need for mental health services. For example, caregivers reported reluctance to use mental health services primarily due to the fear of being labeled mentally ill. Transportation was cited as a contributing factor affecting access to services. There was concern that Latino older adults have difficulty obtaining reliable, appropriate, and affordable transportation to mental health services. Transportation was cited as a contributing factor affecting access to services. Although this is a qualitative study with older Latino residence of San Diego, the findings suggest that community transportation options may be available but may be underutilized for a variety of reasons. While concerns about cost and availability of transportation are noted, strategies to reduce the stigma associated with mental health also need to be addressed.

#132 Goodwin JS, Hunt WC, Samet JM (1993). Determinants of cancer therapy in elderly patients.

This study examined factors associated with non-receipt of definitive treatment among persons diagnosed with breast, prostate, or colorectal cancer based on data from a tumor registry on persons age 65+ in six New Mexico counties (n=669) . Definitive therapies were identified for each cancer site, stage and treatment and individuals were categorized as having received or not received the definitive treatment. Bivariate and multivariate analyses were conducted examining the factors associated with receiving less than definitive treatment. Limited access to transportation was included as one of the independent predictors and was defined as not driving a car and not living with someone who drove a car. Findings revealed that those with limited transportation access were three times as likely of not receiving definitive treatment. Controlling for physical activity, income, activities of daily living and support, those who did not drive or live with a driver were four times more likely of not receiving definitive therapy. However, transportation differences were no longer significant once age was included into the analyses. What was interesting in this study was that limited access to transportation appeared to be a significant influence on not receiving follow-up radiation therapy but not surgery. The authors cited a reference reporting that one-third of older adults diagnosed with cancer in New Mexico depend on others for transportation and this need increases with age (Goodwin, Hunt & Samet, (1991 Archives of Internal Medicine). Again, these findings suggest that the need for non-emergency medical transportation may depend on not only the diagnosis but also the type of follow-up medical treatment (follow-up, surgery). No justification or rationale is provided for this.

135 Gwira JA, Vistamehr S, Shelsta H, et al. (2006). Factors associated with failure to follow up after glaucoma screening: A study in an African American population.

This study was based on a retrospective survey of African Americans age 40+ in New Haven, CT (n=273) on factors associated with not seeking care following glaucoma screening. Responding to a glaucoma screening advertisement through local media and flyers participants receiving glaucoma screening were monitored to determine who complied and who failed to seek recommended follow-up medical care. Those who completed both phases were considered compliant even if a reminder was required. The findings revealed that participants without access to a car had 2.0 times the odds of being non-compliant compared to those with car access. Similar to other studies, the significant association between not having access to a car and non-compliance is independent of income level, education and living arrangement suggesting that lack

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of transportation rather than socio economic status is the reason for underutilization. These findings, in combination with findings from other studies, suggest that a lack of access to transportation is critical in preventive services for older adults.

#142 Iezzoni LI, Davis RB, Soukup J, O'Day B (2002). Satisfaction with quality access to health care among people with disabling conditions.

This study used data from the Medicare Current Beneficiaries Survey 1996 which included community dwelling beneficiaries of all ages (n=16,403). While this study focused on factors associated with satisfaction with access to health care services, transportation barriers are not explicitly evaluated. It was found that participants with moderate or major disabling conditions report increased dissatisfaction with access. Older adults with disabilities in vision, hearing, walking, reaching overhead, and grasping all reported significantly more dissatisfaction with ease and convenience of getting to the doctor. No significant differences were found for rural/urban location after adjusted for age, sex, race, ethnicity, education, income, usual source of care, proxy respondent, and managed care. Findings point to a general greater difficulty in ease and convenience of getting to the doctor among elderly with functional and sensory deficits.

#197 Nickasch B, Marnocha SK (2009). Healthcare experiences of the homeless.

One of the most disadvantaged populations for access to non-emergency medical care is homeless or near homeless older adults. This qualitative study examined the lack of resources and availability of healthcare among homeless older adults. Open-ended interviews with 15 homeless persons in Wisconsin were conducted focusing on their health care experiences. While the study is limited in specific details concerning transportation, the authors provided critical comment to transportation and diabetes. Within the theme of lack of available resources, inadequate transportation to health care services for persons with uncontrolled diabetes was an identified barrier. The authors conclude that the lack of a permanent address or a telephone number makes scheduling a doctor's appointment and use of community resources more difficult. The authors also note that almost no literature has focused on transportation to health care among homeless older adults. Research should be directed to determine if and how non-emergency medical transportation can address this unmet need.

#259 Yeatts DE, Crow T, Folts E. (1992). Service use among low-income minority elderly: Strategies for overcoming barriers.

Unlike missed appointments where the rider has missed a specific pre-arranged ride, underutilization may include factors that preclude older adults from non-emergency medical transportation use even when they are eligible and in need. A major barrier associated with use is negative attitudes toward receiving help. Very little is known as to why eligible older adults do not use medical transportation services, however, cultural factors associated to negative attitudes toward receiving help may be a significant barrier (see #139). This study reported findings from a survey of 28 Area Agency on Aging (AAA) directors on best practices for facilitating service use among older minority populations. The study focused on services in fixed locations and

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did not examine transportation services. However, several findings may of use in understanding cultural barriers to use of non-emergency medical transportation. Negative attitudes toward receiving help may be relevant to nonuse. The authors suggest a need to address this issue in the context of minority elderly underutilization of specific types of health care.

#214 Ritter B, Kirk AB (1995). Health care and public transportation use by poor and frail elderly people

This study focuses on access to and fear of use of public transportation among 1083 low-income elderly attending daytime meal programs in communities from three metropolitan counties in Florida. Participants completed a survey on a broad array of topics including socio-demographic characteristics (age, gender, health, and income), social and health service, social support quality of life, and adequacy of housing and use of health care services. In analyses pertaining to transportation, it was reported that most elderly depended primarily on public transportation and 6.1% reported a lack of transportation as a reason for not receiving medical care in the past six months. Other major reasons for underutilization of health care services include inadequate funds/co-pay costs (14%) inability to find a physician (5.5%) and excessive wait time in medical office (8.1%). Two multivariate analyses were conducted to examine the relative contributions of all variables, including availability of transportation, in predicting use of emergency medical care and ongoing medical care. In both analyses, a lack of available transportation was significantly associated with underutilization of emergency medical care and in obtaining ongoing medical care. While the consequences of under use on medical care due to transportation were not directly addressed, these findings suggest the need for additional attention to transportation. In this case, public transportation was available but for various reasons, was considered not acceptable.

Costs

#15 Rust G, Ye J, Baltrus P, Daniels E, Adesunlove B, Fryer GE (2008). Practical barriers to timely primary care access: Impact on adult use of emergency department services.

This study examines the association between barriers to timely use of primary care and use of emergency department services based on data for the National Health Interview Survey. Controlling for socio-demographic characteristics (age, gender, race, education, income and barriers to timely primary care use) it was found that persons reporting a lack of transportation as a barrier to timely access to medical care were almost twice as likely (OR=1.88) to use emergency department care compared to those who did not report a transportation barrier. Lack of transportation as a barrier contributing to increased ED use was greater than all other barriers examined including; couldn't get through on the phone, could not get appointment soon enough, wait too long in doctor office, and not open when you could go. While this study does not focus exclusively on older adults, it is one of the few studies that document the "cost" consequence of transportation in terms of use of more costly emergence department care.

1425 K Street, NW, Suite 200 • Washington, DC 20005 • P 202.347.3066 • F 202.737.7914 • Toll-free 800.659.6428 • TDD 202.347.7385

#40 Xu KT, Smith RS, Borders TF (2003) Access to prescription drugs among non-institutionalized elderly people in West Texas.

This study examines the factors associated with access to pharmaceutical services based on a random telephone survey of 3498 elderly in West Texas. Respondents were asked about access to pharmaceutical services at four level; 1) if they were currently taking prescription drugs, 2) perceived difficulty in obtaining prescriptions drugs, 3) have insurance to adequately cover prescription drugs and, 4) whether they had a usual pharmacy. The majority (80%) of elderly currently taking prescription medications had no difficulty obtaining them. Concern about transportation costs and travel distance to pharmaceutical services were reported almost half (45%) expressing a concern about transportation and 28% reporting a concern about travel distance. In multivariate analysis controlling for predisposing, enabling and need factors, concern with transportation costs was not significantly related to problems obtaining prescriptions. However, concern about travel distance was associated with difficulties obtaining prescriptions. This suggests that transportation costs and transportation distance are not one in the same in terms of predicting access difficulties and that concerns with transportation may be dependent on and demographic and resource characteristics.

#149 Katon W, Unutzer L, Williams JW, Schoenbaum M, Lin EHB, Hunkeler EM, Cost effectiveness and net benefit of enhanced treatment of depression for older adults with diabetes and depression.

This randomized controlled trial examined the impact of a comprehensive enhanced multifaceted depression treatment program for older adults with clinical depression. The program, titled the Improvement Mood-Promoting Access Collaborative trial (IMPACT), included a coordinated multi-component strategy to address depression consisting of behavioral interventions, psychotherapy and weekly supervision by a psychiatrist and primary care physician and compared outcomes to participants in a usual care control group. Besides assessing changes in depressive symptomology and depression, outcomes included functional status and cost effectiveness. It was not clear if transportation was provided as a component of the intervention. However, it was suggested the cost and cost effectiveness found in the intervention group may be partially be due to lower number of medical visits. This study suggest that interventions pertaining to cost of non-emergency medical transportation can be viewed in terms of cost savings as a result of reduced need for transportation as well as cost saved by providing needed transportation.

Rural Transportation, Rural/Urban Contrasts

#30 Goings TR, Williams KA, Carter MW, Spencer M, Solovieva T, (2005). Perceived barriers to health care access among rural older adults: A qualitative study.

In this study a series of thirteen focus groups were conducted with rural West Virginia residents about their perceptions of barriers when assessing needed health care. The researchers identified five content areas or themes within the focus group transcripts; transportation difficulties, limited health care supply,

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lack of quality health care, social isolation and financial constraints. This study provides additional detail concerning the context of transportation difficulties. Specifically, older participants reported on the difficulty of being required to travel to urban areas for health care especially specialty care (e.g. cancer treatment). They also raised concerns with medical transportation being able to reach them at their home due to unmarked roads and extreme weather conditions such as heavy snow. This study is one of the few that specifically identify the limitation of medical transportation programs with 6% of the 101 participants reporting such problems. This study suggests a need to better understand regional differences in rural medical transportation barriers. While most studies have concluded that older adults in rural areas have greater need for non-emergency medical transportation than urban areas, the specific transportation barriers are likely to differ from one rural setting to another.

#34 Fitzpatrick AL, Powe NR, Cooper LS, Ives DG, Roseman (2004). Barriers to health care access among the elderly and who perceives them.

In one of the largest surveys of older adults perceptions of barriers to health care services, Fitzpatrick and colleagues (2004) examined perceived access to health care among Medicare beneficiaries in the Cardiovascular Health Study. A total of 4889 older adults participated in the survey which asked where they received their medical care, how easy is it to be seen by a doctor and what the major barriers to receiving such care. The focus of the study was to better understand what sociodemographic factors are associated with access to care. A subset (12.2%, n=592) of respondents reported at least one barrier that affected their ability to see a doctor (defined in terms of either moderate amount, very much, or a whole lot). The nine barriers listed in the survey included transportation difficulty, doctor not responsive to concern, medical bills, fear and safety on streets, fear of discovery of serious illness, fear of unneeded tests, not having a regular doctor, taking care of others, and work responsibilities. The three most frequent barriers reported were doctor not responsive to concerns (32.9%), medical bills (22.3%) and transportation problems (22.3%). Minority older adults were significantly more likely to report transportation problems than white older adults. These findings are compatible with other surveys showing that a significant proportion of older adults report transportation difficulties as a barrier to health care.

#50 Reif SS, DesHarnais S, Bernard S (1999). Community perceptions of the effects of rural hospital closure on access to care.

This case study on the consequences of hospital closures in rural settings provided a perspective of how such closures may increase the need for non-emergency medical transportation among vulnerable older adults. This study conducted interviews with health professionals from rural areas which had hospital closure with matched comparison areas where hospitals remained open. Health professionals from both areas were interviewed about changes in physician services in their areas and the impact on vulnerable older and disabled populations in the area. Compared to health professionals in rural settings with continued hospital services, health care professionals from hospital closure areas reported greater difficulty recruiting and retaining physicians as a result of the closure and an increased in the distance and travel time to the nearest hospital (and other health care services). The impact of rural hospital closures decreases when the hospital

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is converted to a health clinic. The significance of this case history study is that it suggests that demand for medical transportation services is influenced not only by the increased prevalence of older individuals in rural areas but also the closure of critical health care facilities such as hospitals.

#51. Alexy BB, Elnitsky C (1998). Rural mobile health unit: Outcomes.

An alternative to providing older adults transportation to needed health services is to bring the needed services to their homes. Findings are reported on a program in which a rural mobile health unit was provided as an alternative model of healthcare delivery in rural areas with limited resources and health care providers. The mobile health unit project was rolled out in two rural counties with a total of 47,000 residents. There were 190 project participants that used the health unit and 32 participated in the home visit component. Development of the mobile unit had a significant impact on use of health care services, including increased breast and cervical screenings, increased immunizations, and decreased utilization of the emergency room. An advantage of such a program is that providing health care services in the home provides an opportunity to observe the older patient's functional independence and ability to maintain their health resulting in opportunities to arrange for needed community based services and assistance.

#90 Bellamy GR, Stone K, Richardson SK, Goldsteen RL (2003). Getting from here to there: Evaluating West Virginia's rural nonemergency medical transportation program.

Bellamy and colleagues examined reach, satisfaction and costs associated with provision of nonemergency medical transportation to rural West Virginia older adults. This program, called the Transportation for Health Project, was designed to assist persons who struggle with access to health care due transportation difficulties. The authors report regional statistics that only 3 percent of the rural population reported depending on commercial transportation service provider, (e.g., taxi or bus) but the need for alternative transportation was greatest for rural older adults with over 40% reporting being dependent on others for transportation. The intended target audience for this program was persons who could drive but had an unreliable vehicle or disabling condition that made driving difficult, persons who had informal transportation, or persons with no form of transportation. The key questions addressed in the evaluation include; did the program reach the intended population, were the users satisfied with the service, and was the program sustainable? A general population survey was conducted to describe the target population, measure awareness of services, and satisfaction. Based on demographic characteristics of the riders (age 65+, female, Medicaid/Medicare recipient), it was concluded that program was successful in reaching its intended audience. Respondents were satisfied with the service they were receiving. Over 90% of the 203 transportation users surveyed reported being satisfied with scheduling arrangements, courtesy and promptness of drivers and the overall service. However, in terms of maintenance of the transportation program, only one of the three bus/van providers approached a financial break-even on cost. In order for a program like this to be sustainable there would need to be increased revenue, possibly from increased Medicaid ridership.

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#115 Collins B, Borders TF, Tebrink K, Xu KT (2007) Utilization of prescription medications and ancillary pharmacy services among rural elderly in west Texas: Distance barriers and implications for telepharmacy

This study examined whether distance to pharmacies reduces access to prescription medication and other prevention services such as immunizations and blood pressure and glucose monitoring among older patients. Another component if this study was to determine whether the decision to provide ancillary pharmacy services (telepharmacy) no closer than 10 miles of existing pharmacies was appropriate as measured by reduced rates of taking prescription medications. The key finding pertaining to transportation was that significant reductions in use of prescription drugs was not observed until the person was greater than 30 miles from a traditional pharmacy. That is, those living 31 miles or further from a traditional pharmacy had a significantly lower frequency of prescription drug use. The findings remained significant controlling for socio-demographic characteristics such as age gender, race, household income and insurance. The researchers conclude that rural elderly who are at a considerable distance from pharmacy services, are at greater risk for decreased access to prescription medications and this risk may be due to an inability for them to travel long distances.

#223 Sharkey JR, Horel S, Han D, Huber JC Jr. (2009). Association between neighborhood need and spatial access to food stores and fast food restaurants in neighborhoods of Colonias

Sharkey and colleagues (2009) provide findings demonstrating the complex interaction between the lack of transportation and community environmental resources on risk for poor nutrition. Three counties in rural Texas, identified as being high in resource needs, were examined with respect to the location of food accessibility. Location points were mapped for food availability in terms of traditional food stores (supercenters, supermarkets, and grocery stores), convenience food stores, and non-traditional food stores (mass merchandisers). Using Census data, the number of each type of food stores were categorized by distance (within one mile, and 3 and 5 miles from household). Neighborhood socioeconomic deprivation and percentage of occupied households without an available vehicle was also examined. Food environments were poorest in rural settings with the highest socioeconomic deprivation. That is, access and availability of health food options were lowest in neighborhoods with the highest levels of socioeconomic deprivation. A lack of household vehicle availability (transportation) was also highest in these settings. While this study did not focusing exclusively on older adults, the findings suggest that poor nutrition and food insecurity are greatest in such rural settings and that there is a significant need for transportation services to help these communities gain access to healthy nutrition options.

Mental Health/Mental Illness

#5 Solway E, Estes CL, Goldberg S, Berry J (2010) Access barriers to mental health services for older adults from diverse populations: Perspectives of leaders in mental health and aging.

Solway and colleagues examine access barriers to mental health services based on key informant interviews with 52 local, state and national professionals in aging services and mental health. The objectives of the

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study was to identify the state of readiness of communities to provide mental health services to older adults and to access barriers to these services for demographically diverse older adults. Interviews were conducted with key informants in selected counties in Florida and California. Respondents were in general agreement across the two states in concluding that there is a lack of readiness to address the mental health needs of older adults. Several barriers were identified including, lack of awareness of mental health services, perception that mental health services as being unaffordable, fear of stigma associated with mental illness, and transportation problems, especially in rural areas. The authors also note that access barriers to mental health services differ among different socio-demographic groups of older adults (e.g., race, gender, immigration status, geographic location and age). These findings suggest that while transportation is reported as an access barrier to mental health services, a lack of transportation is only one component of a larger set of access concerns that need to be addressed in order to improve use of mental health services.

#19 Palinkas LA, Criado V, Fuentes D, Shepherd S, et al. (2007). Unmet needs for services for older adults with mental illness: Comparison of views of different stakeholder groups.

The need for transportation for mental health services for older adults in San Diego was the focus of this qualitative study of stakeholders. Using semi-structured interviews and focus groups, health providers, caregivers, and older adults with mental illness were interviewed about their experiences with the mental health system and services, the unmet needs for such services, and the barriers associated with unmet need. Domains of unmet need were identified and the frequency of specific unmet needs raised in each domain was reported. Transportation was organized into two domains; mental health service access and social services. A consistently high proportion (66%) of providers, caregivers and older patients (consumers) citing unmet transportation needs which contributed to reduced engagement in mental health services. The authors conclude that a lack of available, appropriate, and affordable services are particularly difficult for older adults with physical disability, those in rural areas, Latino older adults and those without Medicare and Medi-Cal benefits. These findings provide insight into the relatively higher rate of missed appointments among non-emergency medical transportation services among riders for mental health care services.

#33 Lachenmayr S, Mackenzie G. (2004). Building a foundation for systems change: Increasing access to physical activity programs for older adults.

This study addresses the lack of available transportation for older adults to attend community based exercise programs. A survey of providers in agencies that typically offer exercise health promotion to older adults were surveyed on the types of activity programs offered, capacity to provide such programs, and to identify unmet demands and barriers associated with unmet need. The survey was conducted with agency stakeholders from all counties in New Jersey (e.g., Area Agencies on Aging (AAAs), hospitals, health departments, senior centers). A total of 82% of the 160 surveys received expressed a desire to provide additional exercise programs for their older clients/patients. Over half (57%) identified barriers to meeting the unmet need including lack of trained peer leaders (42%), insufficient funding (32%) inadequate facility space (28%) and inadequate transportation (3%). This study is one of several that identify insufficient transportation as a barrier to providing older adults the means to initiate and maintain healthy lifestyle

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behaviors. While not stated in the study, older adults with difficulties with poor transportation options are more likely to reside in neighborhoods with barriers restricting walking for leisure.

#65 Gurian, B transportation as outreach, driver as mental health worker

Gurian (1992) described a pilot transportation program for older adults that trained the driver as a mental health resource for the older passenger. A case study was presented in which an Area Agency on Aging and a private nonprofit mental health service vender collaborated in developing a 3-day training program for volunteer drivers willing to participate. The training helped drivers to identify older riders with significant mental health problems and to make refer riders who may be in need of physical and/or mental health services. Besides training on psychological issues, six drivers were trained on addressing possible emergency situations such as falls during transportation, sudden chest pains, alcoholism and CPR. Out of 10,000 round trips provided to 150 riders, assistance with mental health needs and physical limitations was provided by these trained drivers.. The author provided two case studies describing the positive impact of the interaction between drivers and the older passengers. This program and training could be used as a model to promote mental health, advocacy, information, and referrals.

#130 Goings RT, Hayes JC, Landerman LR, Hobbs G (2001).

Goings and colleagues examined the health impact of transportation services among older adults over time. Based on the Established Populations for Epidemiologic Studies of the Elderly (EPESE), changes in self ratings of health among older adults were examined over a four year period. A logistic regression that included socio demographic characteristics (e.g. age, gender, race, education), health status (e.g. activities of daily living (ADLs/IADLs), number of chronic conditions, symptoms of depression) health practices (i.e., BMI, alcohol and tobacco use), and barriers to health care (e.g., cost, transportation, unsure where to go) was used to predict changes in the number of persons in excellent/good health to fair/poor self-ratings of health (SRH). Only 5% of the 2982 older participants moved from excellent/good health to fair/poor SRH over three years. Living a considerable distance from health care providers and transportation problems were offered by 268 older adults as reasons for not getting needed health care. However, transportation was not significantly associated with change in self-rating of health. While self-rating of health is a common outcome measure in aging and health research, it may not be appropriate as a measure of health impact of transportation. More proximal outcome to transportation may be more appropriate.

#136 Hanson D, Emlet CA (2006). Assessing a community's elder friendliness: A case example of AdvantAge initiative.

A limiting factor in understanding the association between transportation and health among older adults is the lack of a comprehensive model based on a broad ecological perspective. Hanson and Emlet (2006) provide the AdvantAge Initiative model that identifies four domains of community characteristics that promote the health and well-being of older adults. The four domains that contribute to an elder friendly community are ones that; 1. address basic needs of the older residents 2. promote social and civic

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engagement, 3. optimize physical and mental health and well-being and, 4. maximize independence for the frail and disabled. It is in the last domain, maximize independence for frail and disabled, that accessible transportation is identified. The authors state that transportation is essential for successful aging because it enables seniors to be mobile and engage in community activities and resources. While this model has not been widely adopted or applied to transportation, it has the potential to address the role of transportation and health in the context of the availability of other resources contributing to the health of older adults.

#203 Pang KYC, (1996). Self-efficacy strategy of elderly Korean immigrants in the Washington DC metropolitan area.

This qualitative study explored self-care strategies of older Korean immigrants in the greater Washington DC area by providing five case studies that examined self-care and coping strategies among older Koreans with depression. One source of stress noted among caregivers was associated with the burden of family members taking time off from work in order to provide transportation to older relatives. This is one of many studies that identified the stress experienced by the older relative as a result of needing to depend on their children for transportation. Even if they don't need a car for employment, one older Korean immigrant learned how to drive at age 77 to be independent. This qualitative study was in agreement with other studies stressing the importance of transportation as a means of improving mental health through social contact.

Health Behaviors

#10 Shores KA, West ST, Theriault DS, Davidson EA. (2009). Extra-individual correlates of physical activity attainment in rural older adults.

In one of the better designed surveys that address the role of transportation on health behaviors, Shores and colleagues examined the association between transportation access and level of physical activity among rural older adults in North Carolina. A representative sample of 447 adults age 65 years and older were surveyed on their current level of physical activity, socio-demographic characteristics, support for physical activity and three measures of access; living within walking distance to a park, inability to participate in physical activity due to a lack of transportation and, recreational facilities available near home. Findings revealed that older rural adults surveyed generally agreed that they had adequate transportation to reach recreation facilities. No significant differences in access to transportation were found between older adults who meet or exceed current recommendations of physical activity and those who don't. These findings suggest that proximity to recreation facilities is critical to being physically active among rural older adults and transportation is not a significant factor in being physically active.

#160 Lee C Moudon A (1998). Physical activity and environment research in the health field: Implications for urban and transportation planning practice and research.

In a review of the literature, Lee and Moudon identify a lack of transportation as a barrier to physical

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activity. They cite a focus group study by Eyler (1998) who reported that older minority Americans felt that transportation would help levels of physical activity. The review concludes that transportation can promote health in older adults by providing transportation to environments and settings more accommodating to walking and physical activity. Unfortunately this review did not provide sufficient support for this conclusion.

#141 Hubbell AP (2009). Mexican American women in a rural area and barriers to their ability to enact protective behaviors against breast cancer.

A qualitative study was conducted with Mexican American women in rural New Mexico to determine barriers, perceptions and beliefs related to breast cancer protective behaviors including self-examination, physician exam, and mammography. Although this study was not restricted to older adults, 16 of the 48 participants were age 40 and older. The interview focused primarily on typical person-level beliefs such as perceived threat and seriousness of breast cancer. However, one finding pertaining to transportation was reported. It was found that the second most frequent reason given for not receiving a mammography was the long distance to get to the physician/clinic. The author described this as a problem in access to transportation for critical care services which are often considerable distance in more urban areas

#178 Marchall, Lopez, Shetterly, Morgenstein, Baer, Swenson, Baron, Baxter, Hamman, (1999).Indicators of nutritional risk in rural elderly Hispanic and non-hispanic white population: San Luis Valley health and aging study.

This study examined nutrition risk among Hispanic and non-Hispanic White older adults in rural Colorado. While it did not directly address or link transportation to poor nutrition among older adults, the authors did discuss a potential link. In the discussion section, they note that older adults with transportation difficulties are less able to shop at the largest supermarkets in urban areas which frequently have the best selection of and prices for fruits and vegetables. Instead they rely on small convenience and grocery stores with limited selection. They also state that older adults who live in remote areas may not have access to nutrition services such as meals on wheels or transportation to a senior meal or an adult day center.

#253 Wolf WS, Fronillo EA, Valois P (2003). Understanding the experience of food insecurity by elders suggest ways to improve its measurement

The objective of this study was to develop and evaluate a new measurement tool for food insecurity for older adults that is sensitive to the broader experiences older adults leading to food insecurity. Older participants from 46 elderly households in three cities in New York were selected for in-depth semi-structured interviews on what they usually ate, their eating environment, influences on their food situation and their experiences of difficulty getting food. Through a process of item development and evaluation of the tool, transportation was noted as one of the causes of food insecurity in elders. While it is not surprising that a lack of money was a major cause of food insecurity, older adults with enough money for food but were not able to get food due to a lack of transportation also are at risk for food insecurity. The importance of this finding is that adequate financial resources for food does not necessarily mean that transportation needs are no longer a concern

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for older adults. Programs that provide transportation only for those with significant financial need may conclude inappropriately that those with without financial need are not at risk for food insecurity.

Ethnicity/Race Differences

#4 Park NS, Roff LL, Sun F, Park MW, Kim DL, Sawyer P Allman RM (2010). Transportation difficulty on black and white older adults.

This recent study examined race difference in transportation difficulties among Black and White older adults in rural Alabama (Park, Roff, Sun, Parker et al, 2010). The study was designed to determine if race differences in self-reports of transportation difficulty exist and if so, what factors account for differences found. A telephone survey of 255 Black and 259 White older adults was conducted. Survey items were based on the Andersen health behavior model (Andersen, 1995) including predisposing factors (e.g., demographic characteristics), enabling factors (e.g., marital status, income, social support) and need factors self-reported health, co-morbidity, cognitive impairment (MMSE), and depression. Transportation difficulty was defined as stating yes to having any difficulty getting transportation to where they wanted to go or had to limit their activities due to not having transportation. Black older adults were more than twice as likely as White elderly to report transportation difficulty (24.7% vs. 11.6%). However, race differences were no longer significant when age, gender, and income were taken into account. When analyses for Black and Whites are conducted separately, poor cognitive status and greater levels of symptoms of depression among Blacks were significant while only a lack of social support was associated with transportation difficulty among White rural elderly. While these associations are not causal, the findings suggest that there may be ethnic differences on the health impact of transportation difficulties.

#9 Rodriguez-Galan MB, Falcon LM (2009). Perceived problems with access to medical care and depression among older Puerto Ricans, Dominicans, and a comparison group of non-Hispanic whites

This study examined the association between self-reported symptoms of depression (CES-D) and perceived problems in access to medical care among Puerto Rican, Dominican, other Hispanic and non-Hispanic White older adults based on data from the Massachusetts Hispanic Elders Study (MAHES). A primary hypothesis was that problems related to medical care access would be associated with higher levels of depressive symptomalogy among older Puerto Ricans Analyses compared Hispanic older adults to non-Hispanic White older adults in the same neighborhood. Respondents were asked to select from a checklist of common assess problems that included transportation problems (e.g., cost, inconvenient office hours, did not speak Spanish, did not have a way to get there). Compared to non-Hispanic White older adults, a greater percentage of Hispanics reported significantly more access problems (9% versus 22%). Access problems due to lack of transportation was the most common barrier reported by the Hispanic group, especially Puerto Rican elders. While this study found that medical care assesses problems was correlated with greater depression among older adults, access problems due to transportation were embedded in a combined scale with other access concerns, thereby making it difficult to directly link depression to transportation problems. This study is significant at several levels. It provided important insight into the heterogeneity of

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transportation concerns within ethnic groups. It also examined the impact of access barriers to health care in the context of symptoms of depression.

#86 Aroian LJ, Wu B, Tran TV (2005) Health care and social service use among Chinese immigrant Elders

The complex role of transportation in underutilization of health and social services is illustrated in this qualitative study. The authors conduct a series of focus groups and interviews designed to examine patterns and reasons for health and social service use among older Chinese elders in Boston. A group of 27 Chinese immigrant elders, 11 of their adult children and 12 health and social service providers participated in in an in-depth discussion of factors associated with use of traditional and Westerns health services and social services and causes for underutilization. Perceptions were similar across the three groups. In general, transportation difficulties were cited for all three services. However, transportation was not an issue among Chinese immigrants living in Chinatown. This suggests that the association between access and use of transportation may be dependent on language and cultural factors. Boston is a transportation rich environment, use of public and alternative transportation was difficult because of language barriers. However, navigating the transportation options becomes difficult in settings without a shared language or culture. "If I take transportation by myself, I am afraid I will get lost and not know how to return back home" (p 100). As in other studies, this study identified the burden of family providing transportation to their older relative in terms of sick/vacation days with their employment.

#229. Smith C, Morton LW, (2009). Rural food deserts: Low-income perspectives on food access in Minnesota and Iowa

This study was primarily a qualitative analysis of 57 residents living in Minnesota and Iowa.to investigate how low income persons living in food deserts accessed the traditional food system, as well as food safety net services. Findings from the 7 focus groups conducted revealed that there were three major themes; personal and household determinants of food; social and cultural environment; and structure of place or the external environment. It was concluded that physical and social environments place constraints on food access, even in civically engaged communities. A subtheme of transportation issues was identified within the theme of structure of place. Specifically, it was noted that residents in rural settings reported transportation barriers due to the cost of traveling to more urban areas with better food choices and lower cost for food. While less than 7% of the participants in the focus were age 65 years and older, it is likely that this finding would be applicative to older adults in general.

Other Related Transportation

#84 Applebaum R, Regan S, Woodruff L (1993). Assuring the quality of in-home supportive services: An evolving challenge.

Unreliable transportation resources for health care workers can also have an impact on the health of older adults. In a review article identifying critical issues in assuring the quality of home care services, Applebaum,

Regan and Woodruff (1993) reported findings from a telephone satisfaction survey by consumers of home care services. About one fifth reported that home care workers did not arrive on time and 17% were not informed when the worker was unable to arrive at all (Applebaum, Regan, Woodruff, 1993). Such health care worker "missed appointments" has not been adequately examined but they may have significant consequences on quality of care and the health and well-being of the older clients.

Non Relevant

#8 Ward (2009). Disaggregating race and ethnicity: Toward a better understanding of the social impacts of transportation decisions. Nor relevant While this paper report findings that 10.3% of US residents lack of available transportation (no vehicle available), no analyses were conducted by age-group.

#31 Anderson, Koler, Letiecq (2005)Not relevant outcomes of transportation not addresses

#36 Bartels, Coakley et al (2004) Transportation not examined.

#60 Costanza, 1994 No substantive information.

#85 AreanMackin, Vargas-Dwyer, Raue, Sirey, Kanellopolos, Alexopoulos (2010) No substantive information

#91 Bismark, Brennan Paterson et al. (2006) New Zealand study on complaints in emergency transport.

#93 Bloomfield, Kimaiyo, Carter et al. (2011) Study based in Africa.

#95 Bowen, Gonzales, (2008) Transportation not examined as a factor contributing to ethnic differences on use of health care services,

#103 Burr, Mutchler, (2007) Population county size was used as a proxy for unmeasured community characteristics such as tax burden, transportation constraints and crime. As such, it cannot be used as a link between transportation and health.

106 Callahan CM, Kroenke K, Counsell SR, Hugh C, et al. (2005) Transportation not addressed

#127 Finlayson, Garcia & Cho, (2008). The authors found that, compared to small town rural settings, persons un urban-suburban settings were more likely to use occupational therapy services. They conclude that a lack of transportation was a cause of this difference. The study did not provide empirical support for this conclusion.

#128 Freburger and Holmes, (2005) This study examine factors associated with used of physical therapy use among older adults. A proxy measure of transportation (ease and convenience of getting to a doctor from where you live) was included in the study design but was combined into a larger overall health care

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satisfaction measure thereby eliminating any conclusions about transportation.

#129 Gary, Safford, Gerzoff, et al. (2008) This study examined perceptions of neighborhood problems on health practices and diabetes outcomes among persons with diabetes. One question asked how much of a problem is access to public transportation in your neighborhood. This question was combined with five other unrelated neighborhood problems into a summary score. All analyses were based on the summary score rather than the item on transportation.

#131 Gollop, (1997) This study's focus is on health information seeking behavior of older African women. Transportation was not addressed.

#147 Joseph, Waldman, Rawls, et al. (2008). This qualitative study examined perceptions and attitudes toward tuberculosis and seeking treatment for TB. The only information about transportation was that one individual lacked reliable transportation; "I have problems with transportation. I don't have a car, so I had to take a taxi."

#161 Lennox, Bain, Rey-Conde, et al (2007) Transportation not examined

#168 Linblad, Hanlon, Artz, Fillenbaum, McCarthy (2003) Transportation not examined

#169 Liu, Chen, Chi et al, (2010) Focus in transportation in China

173 Magilvy, Congdon, (2000). Transportation not examined

#187 McNally, (2003) Focus of document was in South Pacific (FIJI)

#192 Mollica, Doneian, Tor, et al. (1993) Study in Thailand-Cambodian border displaced persons

#201 Owsley C, McGwin G Jr, Scilley K, Meek GC, Seker D, Dyer D (2007).Study of nursing home residents and delay of medical care. Transportation was not directly assessed.

#207 Porell, Miliades, (2001) This study defined transportation as a barrier to health service utilization as having a travel time of 30-minutes or longer to one's regular provider. The researchers found that Medicare beneficiaries with a travel time greater than 30 minutes had 38% greater odds of becoming IADL disabled than those with a shorter time to their care provider. However for most individuals, travel time may not be mutable risk factor in terms of transportation service. These findings may offer insight into potential health differences between urban rural older adults.

#218 Sanders S, Polgar JM, Kloseck M, Crilly R. (2005). Homebound older individuals living in the community: A pilot study. While transportation was noted, no findings of substance was reported.

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#247 Wallace, Levy-Storms, Ferguson, (1995) transportation not examined

#255 Wood (2008) This study addresses access to health care services for HIV-positive substance abusers in rural settings and comment that transportation is a barrier to such services. However, no findings were provided to support this and not for older adults.

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