Call to Reduce Hospitalizations

USING PHONE ASSESSMENTS TO PREDICT & AVOID HOSPITALIZATIONS FOR MI CHOICE PARTICIPANTS

Program evaluation by Mabie & Co. on behalf of

Area Agency on Aging 1-B
Advocacy • Action • Answers on Aging

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Summary

In 2015, the Area Agency of Aging 1-B piloted a program in an effort to reduce unnecessary hospitalizations for MI Choice participants. This program incorporated the use of a predictive, web-based technology developed by Care at Hand, Inc. which assesses hospitalization risk based on responses to phone assessments. Notable findings are detailed in the following report and highlighted below:

- Participation in the AAA 1-B's phone assessment program reduced hospitalizations. Of the population not receiving the program's phone assessments, 18% were hospitalized, while 12% of program participants were hospitalized during the 90-days. This relationship between participation in the pilot program and reduced hospitalizations is statistically significant ($p < 0.05$).
- Program participants with no hospitalization received an average of five more hours of informal care in the three days prior to the time of the survey than those who were hospitalized. This relationship between hospitalization and the hours of informal care received in the previous three days is statistically significant among program participants ($p < 0.10$).
- Program participants who were hospitalized reported having a relative other than spouse, child/child-in-law, parent/guardian, sibling, or partner as a secondary helper 15% more frequently than those avoiding hospitalization. Among program participants, hospitalization and the participant's relationship with a secondary helper is statistically significant ($p < 0.001$).
- Participation in the pilot program empowered MI Choice participants to actively engage in their health care and appropriately address red flags related to their health concerns.
- Caregivers were especially appreciative of the pilot program and were more apt to incorporate education regarding appropriate responses to health concerns.
- The telephonic assessment resulted in a duplication of AAA 1-B participant inquiries which stunted the program's efficiency and effectiveness.

Based on participant outcomes, the AAA 1-B's pilot program successfully predicted and avoided hospitalizations. Applying pilot program staff feedback, this program should be adapted, incorporated into regular AAA 1-B operations, evaluated, and replicated in the future.

Reducing avoidable hospital admissions for older adults and individuals with a disability improves their quality of life, preserves limited financial resources, and lessens strain on the care management systems supporting these populations.

As a home- and community-based service provider in southeast Michigan, the Area Agency on Aging 1-B (AAA 1-B) seeks to improve outcomes for older adults and adults with disabilities. With funding support from the Blue Cross Blue Shield Foundation of Michigan, the AAA 1-B launched a 90-day pilot program aimed at reducing avoidable hospital admissions. Beginning in October 2015, this pilot program utilized a computerized system for assessing hospital admission risk, implemented via telephone survey.

Evidence indicates this predictive web-based system reduces hospital readmissions among Medicare participants.[1, 2] The AAA 1-B pilot program sought to test the technology's efficacy at reducing hospitalizations for participants of the MI Choice Medicaid Waiver (MI Choice) program. This evaluation report details quantitative results and qualitative feedback regarding the program provided by AAA 1-B staff involved in the pilot program's operation.

Program Description

Pilot program participants were randomly selected from AAA 1-B clients residing in Macomb and Oakland County, Michigan. The AAA 1-B then included all other clients in this population in the control group. All of these individuals were MI Choice participants, meaning they are older adults and younger adults age 18 and older with disabilities who have limited financial resources and who medically qualify for Medicaid nursing home admission. The Individuals in the control group and pilot program participants continued receiving existing services through the AAA 1-B during the course of the program.

Participation in the pilot program was voluntary. Family or professional caregivers could complete the assessment on the participant's behalf when necessary. Initially enrolling 207 people, the pilot program retained 186 participants throughout the 90-day pilot program (10% attrition rate).

The AAA 1-B utilized a web-based application, Care at Hand, to assess hospitalization risk. Care at Hand technology generates personalized survey questions based on a participant's likely risk factors for re-hospitalization, as predicted by proprietary algorithms.

Surveys consisted of 15 questions and were administered over the

phone by two AAA 1-B staff trained in the use of the Care at Hand platform. Survey questions were specifically designed by Care at Hand to predict re-hospitalization risk for a Medicare population discharged from an inpatient hospital stay within the past 30 days. Participants in the 90-day pilot program received three calls, thirty days apart.

If responses indicated an elevated risk of hospitalization, the web-based application generated an alert to the AAA 1-B Supports Coordinator assigned to the pilot program. The Supports Coordinator followed-up with the participant via telephone usually within 24 hours of receiving an alert.

Methodology

The AAA 1-B contracted with external evaluators, Mabie & Co., to conduct a two-part assessment of the pilot program testing the efficacy of predictive technology at reducing hospitalizations for the MI Choice-eligible population.

Quantitative Analysis

Pilot program surveys were conducted from October 1, 2015 to December 31, 2015. During this time, 186 individuals remained in the program without interruption. The control group consisted of 514 randomly selected MI-Choice participants receiving services through the AAA 1-B.

Program participant and control group data regarding health care utilization, social support, and health and functional status were collected by AAA 1-B staff utilizing the existing client database developed by Harmony Information Systems.

Analysis involving statistical significance seeks to identify whether the participating population's results may be due to chance or are potentially applicable when considering a larger population with similar traits. Statistical significance is indicated by a p-value, a measure of the likelihood that results are due to chance. P-values of less than 0.10 (noted as $p < 0.10$) indicate statistical significance, meaning there is a less than 10% likelihood results are due to chance. Conversely, this indicates a 90% likelihood that the relationship(s) between variables present in the sample population are real and may be applicable to a larger population.

Cross-tabulation or t-tests were utilized to compare variables and assess for statistical significance in the program's data. Data analysis was conducted using IBM SPSS Statistics 23.

Qualitative Analysis

A Mabie & Co. researcher conducted telephone interviews with program staff

Table 1. Hospitalization Rates During the 90-Day Program Period*

Group (n = 700)	No Hospitalizations During 90-Days #	No Hospitalizations During 90-Days %	One or More Hospitalizations During 90-Days #	One or More Hospitalizations During 90-Days %
Pilot Program Participant	164	88%	22	12%
Control Group	421	82%	93	18%
Variance		6%		(6%)

*p < 0.05

including two AAA 1-B staff members responsible for administering participant surveys and the AAA 1-B Supports Coordinator assigned to respond to all alerts generated. Their feedback regarding the program's operation, efficacy, and impact is detailed in this report.

I. Quantitative Results

There is a statistically significant relationship between participation in the pilot program and reduced hospitalizations ($p < 0.05$). Of those participating in the pilot program, 12% were hospitalized at some point during the 90-day program. Within the control group, 18% of people were hospitalized once or more during the 90-day period. This 6% variance in hospitalization rates is statistically related to individuals' participation in the AAA 1-B's pilot program. The rates of hospitalization for each group are detailed in Table 1 and Figure 1.

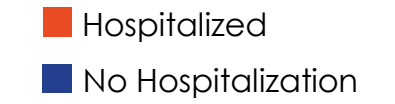
Of those who were hospitalized, 36% of pilot program participants and 21% of control group participants were hospitalized more than once during the 90-day period. The frequency of hospitalization is detailed in Table 2.

Table 2. Total Hospitalizations for Hospitalized Participants

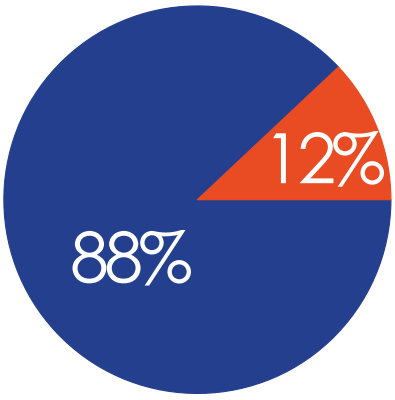
Total Hospitalizations	Program Participants #	Program Participants %	Control Group #	Control Group %
1	14	64%	73	79%
2	7	32%	17	18%
3	1	4%	2	2%
4	0	0%	1	1%
Total	22		93	

Two other variables yielded statistically significant results. First, within the pilot program participant group, hospitalization is statistically significantly related to the hours of informal care received in the previous three days from the time of

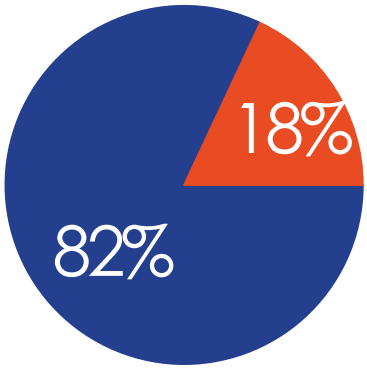
Figure 1. Hospitalization Rates During the 90-Day Program Period*



Program Participants (n = 186)



Control Group (n = 514)



*p < 0.05

the survey (p < 0.10). Program participants who were hospitalized reported receiving an average of 7 hours of informal care over the most recent three days (n = 22). Program participants with no hospitalizations reported receiving an average of 12 hours of informal care over the most recent three days (n = 164).

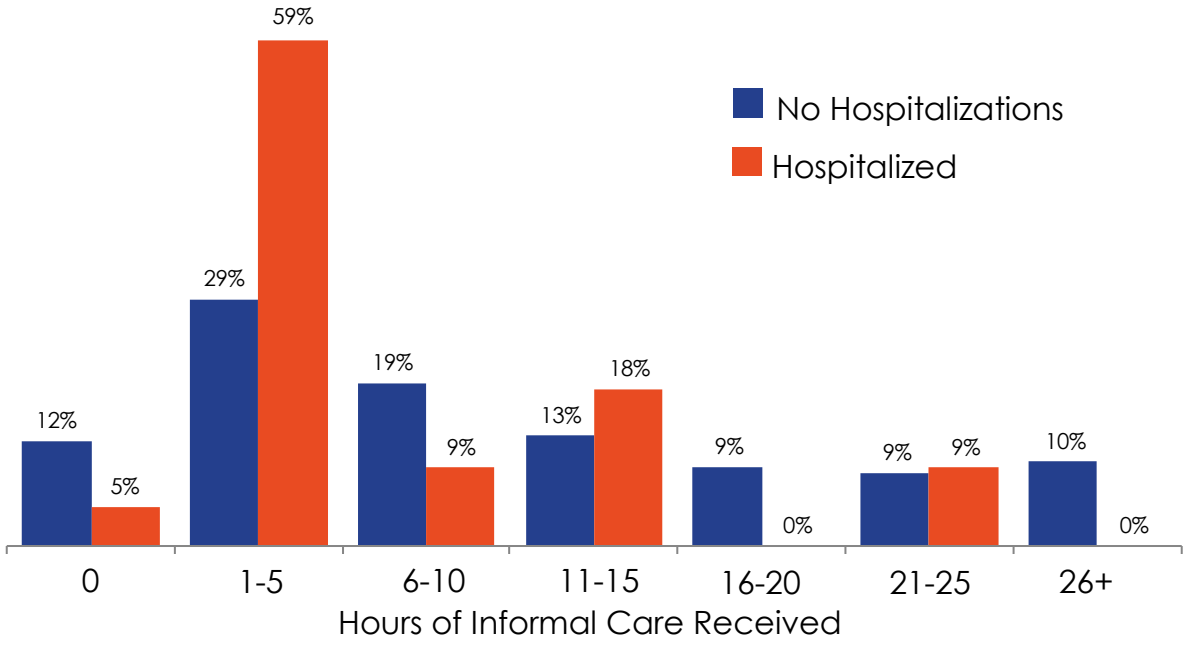
No individual who was hospitalized received more than 24 hours of informal care over the most recent three days, while 10% of those not hospitalized received more than 24 hours of informal care over the most recent three days. Two percent of participants not hospitalized received 72 hours of informal care over the most recent three days, meaning they were receiving 24-hour informal care. Further detail regarding the variances in the amount of informal care received are detailed in Figure 2.

Finally, a statistically significant relationship exists between hospitalizations for those in the pilot program and their relationship to the individual identified as their secondary helper (p < 0.01). The relationship between hospitalization and the participants' relationship to the primary helper is not statistically significant.

Of those in the pilot program, the greatest proportion of participants identified a child/child-in-law as their secondary helper. Of pilot program participants who were hospitalized during the 90-day program period, 41% had a child/child-in-law as a secondary helper. Of program participants who were not hospitalized during the 90-day program, 46% had a child/child-in-law as a secondary helper.

The greatest variance between the

Figure 2. Program Participant's Hours of Informal Care Received Over the Most Recent Three Days from Time of Assessment*



*p < 0.10

two groups was found among those reporting a relative other than spouse, child/child-in-law, parent/ guardian, sibling, or partner as a secondary helper: 23% of those hospitalized had a relative other than those listed above as a secondary helper, while 8% of those with no hospitalization reported this type of secondary helper. This 15% variance was closely followed by the 14% difference between hospitalized participants who reported a spouse as a secondary helper (14%) and non-hospitalized participants who reported a spouse as a secondary helper (0%). These, and other variances are detailed in Figure 3.

The implications of this statistically significant relationship are less evident than those of the other significant results from this study. While this relationship may help serve as an indicator of health—since participants in better health may have less need for certain categories of secondary helpers—further research is needed to better understand the relationship between secondary help and hospitalizations for program participants.

A variety of other variables were tested which did not yield statistically significant results. Some of these, which showed no relationship with hospitalization include: time spent alone, relationship with primary helper, living with primary helper, distress from decline in social activities, and help with ADLs and IADLs. These,

and other variables did not have a statistically significant impact on hospitalization outcomes for program participants nor the control group.

II. Qualitative Results

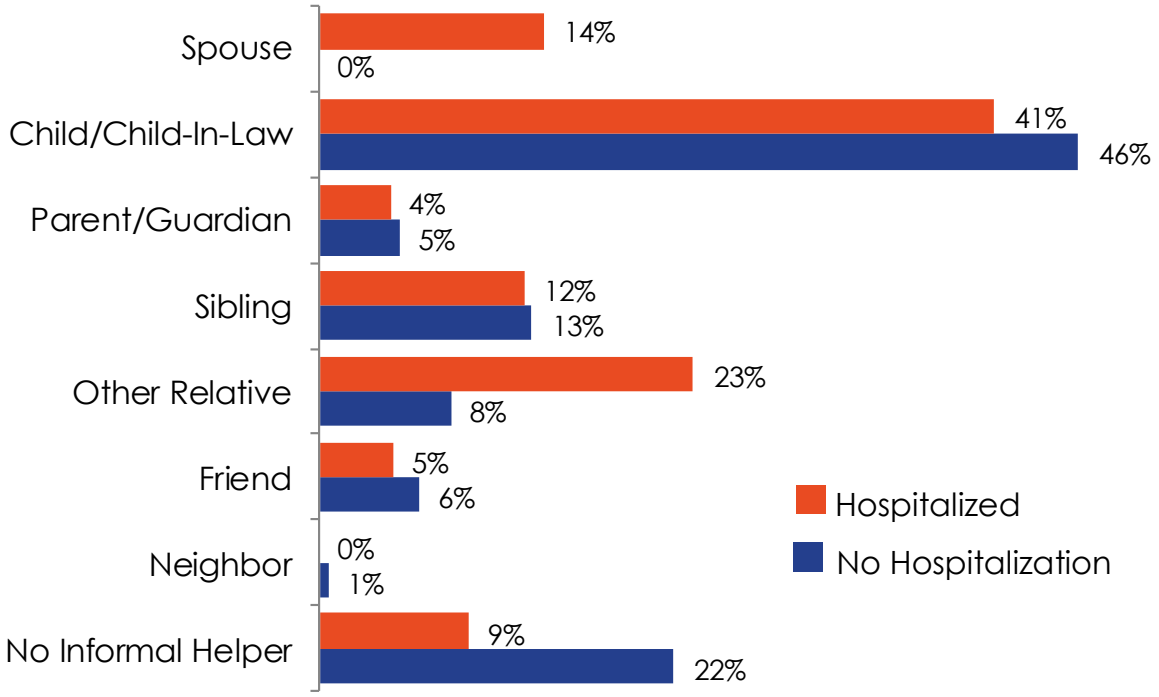
Program staff were asked if the pilot program should be continued. Staff unanimously felt the program should be discontinued as presented during the pilot period, with elements of the program retained and incorporated into the AAA 1-B's existing processes for serving the MI Choice-eligible population. Their rationale is detailed below.

Benefits

Empowerment

Program staff valued the way in which this program empowered participants and caregivers to become more active participants in their health care. "This program helped people see that they have a voice and can combat the idea that health care is something done to them, not done with them," reported a program staff person. Participants and caregivers felt encouraged and empowered to reach out to doctors when concerns emerged and not be reticent when communicating with health care providers.

Figure 3. Program Participants' Relationship with Secondary Helper*



*p < 0.01

Survey questions and pilot program staff explanations of the questions educated participants about the importance of subtle changes in their heath. Participants and caregivers also became knowledgeable about red flags for their health condition(s) and how to appropriately address them.

Filled Service Gaps

Through the assessment and follow-up calls, this program provided additional support and resources to participants. Pilot program callers had a greater amount of time available to speak with respondents than the AAA 1-B's regular monthly callers. This allowed participants to get assistance with time-intensive issues such as renewing Medicaid, understanding and reordering medication, and repairing a home's heating system. Pilot program callers also had the time to educate participants about other AAA 1-B programs and services available to them. As one program staff person said, "ongoing support is a benefit to everyone, and especially those in this fragile population."

The majority of clients responded positively to pilot program callers, responding with gratitude for the additional level of help provided. Program staff reported the program made most clients feel cared for and participants appreciated the follow-up care they received.

Caregiver Support

Caregivers expressed the greatest appreciation for this program. One staff person said, "Calls to caregivers were more impactful than other calls. Caregivers could absorb and be responsive to information better than many of the participants themselves due to their compromised health status." Pilot program staff felt this program directly addressed caregiver isolation and validated these individuals in a meaningful way.

Challenges

Duplication of Service

In its existing service to the MI Choice-eligible population, the AAA 1-B assigns a 30-Day Caller and Supports Coordinator to each participant. The 30-Day Caller makes monthly calls to each individual served and becomes familiar with their assigned participants' needs and concerns.

The pilot program staff frequently encountered confusion regarding why an additional 30-day call was being made by an AAA 1-B staff person different than the assigned Caller or Support Coordinator. Participants responded saying, "I don't know you. Why are you calling me? I already talked to my AAA 1-B caller. Is this a scam?" This duplication of service resulted in participant confusion and reticence. Pilot

program staff frequently had to spend the first minutes of each call reintroducing themselves and the program—an inefficient use of participant and staff time.

Additionally, as the pilot program calls and regular AAA 1-B monthly calls were not coordinated, on occasion participants received these calls within minutes of each other. The pilot program staff found participants to be increasingly irritated and unlikely to participate when calls happened in close succession.

There were also three subpopulations within the participant group whose health was being monitored closely by other care providers, making the pilot program's hospitalization assessment redundant and not of significant value to participants.

First, individuals being served in an adult foster care setting did not reap a substantial benefit from this program. Due to severe health limitations, participants frequently required a health aide to speak to pilot program callers in their stead. Pilot program callers reported adult foster care aides being professionally protective of their clients and sharing minimal information to complete the assessment. Additionally, pilot program staff felt the assessments were redundant since health concerns of participants in the adult foster care system are monitored daily by professional staff.

The second population for whom this program was not a good fit included participants facing terminal diagnoses or multiple acute conditions. Reflecting on a call to a participant with terminal cancer, one pilot program staff member felt it was, "inappropriate and intrusive to be calling these individuals whose medical needs were already being heavily monitored by multiple care providers."

Finally, pilot program staff noted this assessment was not ideal for participants and participant caregivers facing cognitive issues (e.g. dementia). One staff member said, "The fragility of this population is particularly difficult and their caregivers are exhausted and overtaxed." Pilot program staff felt their calls were a more of a burden than a help to this particular subgroup of informal caregivers.

To consider the impact of including these individuals in the program, hospitalization rates for individuals with a cognitive issue as the primary diagnosis are detailed in Table 3. Of the 48 pilot program participants facing cognitive issues as their primary diagnosis, 10% were hospitalized one or more times during the 90-day program period. Of the 113 control group participants facing cognitive issues as their primary diagnosis, 18% were hospitalized one or more times during the 90-day program period. The variance

Table 3. Hospitalization Rates For Individuals with Cognitive Issues as Primary Diagnosis

	No Hospitalizations During 90-Days		One or More Hospitalizations During 90-Days	
Group (n = 164)	#	%	#	%
Pilot Program Participant	43	90%	5	10%
Control Group	93	82%	20	18%
Total	136	85%	25	15%

between the pilot and control group are not statistically significant.

Lack of Standardization & Connection to Participants

Pilot program staff administering participant surveys identified the lack of standardization in the predictive technology and lack of connection to participants as the greatest challenges of this program.

Program staff spoke of a lack of standardization when referencing the technology's heavy reliance on survey administrators' interpretation of the participant's situation, environment, and responses. For example, to generate a personalized survey aimed at identifying increased risk for hospitalization, the web-based platform required the pilot program survey administrators to highlight two or three main health concerns for each participant. This lack of standardization or objectivity in the technology generating surveys poses a particular challenge when working with the MI Choice-eligible population.

Of the MI Choice-eligible population, 60% have multiple chronic physical conditions and 20% have more than one mental/ cognitive condition.[3] This level of complex comorbidity made it difficult for survey administrators with no previous connection to participants to select which health conditions the surveys ought to consider.

Assessments were then limited to the two or three primary areas of concern as indicated by the survey administrator. Other comorbid conditions were not assessed, creating an assessment gap. This survey format made it possible for individuals to have emerging conditions requiring medical attention which were unknown to the program staff.

Similarly, survey questions generated by the predictive technology often relied on the

survey administrator's judgement in order to alert for increased risk of hospitalization. For example, one survey prompted, "How difficult is it to walk around your house?" A participant responded, "It's okay." In situations like this, pilot program staff were instructed by Care at Hand to "go with their gut" whether an issue warranted an alert. This lack of standardization and objectivity within the technology, combined with the lack of familiarity with participants made it difficult to ensure accurate assessments.

False Alerts

As stated previously, the Care at Hand surveys and alert platform was initially designed for the Medicare population following hospital discharge. When tested with this dually-eligible Medicare and Medicaid long-term chronic care population, the technology generated many false alerts. During the first month of the program, one staff member said, "It seemed like everyone triggered an alert." Yet, when the program's Supports Coordinator followed-up with participants, it became evident the triggering medical concern was neither worsening nor required immediate attention.

After the first month, Care at Hand staff adapted assessments in an effort to minimize false alerts. Pilot program staff witnessed a decrease in false alerts following these changes. Even with the reduction in false alerts, program staff still felt this assessment was not tailored for a population facing multiple chronic, long-term health issues.

Recommendations

Assessing hospitalization risk over the phone every 30 days effectively reduced hospitalization rates for the MI Choice population. Based on the program's effectiveness and staff feedback regarding the program's operation, this program should be adapted and incorporated into regular AAA 1-B operations.

Pilot program staff said that a number of the survey questions were insightful and nuanced as assessments of participant health (e.g. How many pillows do you sleep with?). Adapting and incorporating these highlighted questions into regular AAA 1-B calls made by participants' assigned 30-Day Caller allows the AAA 1-B to continue to assess for hospitalization risk without duplicating services. Having the caller be an individual familiar with the concerns and needs of the participant helps minimize false alerts and mitigates the assessment's lack of standardization.

Finally, select subpopulations identified by pilot program staff as inappropriate for this program should be removed from the participant pool. These groups include individuals being served by

the adult foster care system and participants with terminal diagnoses.

Further research should be conducted to determine if participation in this program is effective for individuals with cognitive health concerns as a primary diagnosis. In response to program staff feedback, efforts should be made to minimize the burden of participating in the program for caregivers of this population.

The adapted program should be assessed to verify that the impact on hospitalization outcomes continues after integration into regular AAA 1-B operations.

Conclusion

One of the pilot program staff remarked, "In concept it's a great thing to reduce hospitalizations, but it is difficult to bring into reality." The AAA 1-B's pilot program made notable headway in reducing avoidable hospitalizations for this population facing multiple chronic, long-term health concerns with limited financial resources.

Participant outcome data and feedback from program staff provide valuable insight regarding ways to best serve the MI Choice-eligible population. This program successfully predicted and avoided physically, emotionally, and financially costly hospitalizations and should be adapted and replicated in the future.

[1] Ostrovsky, A., O'Connor, L., Marshall, O., Angelo, A., Barrett, B., Majeski, E., …Levy, J. (2016). Predicting 30- to 120-day readmission risk among Medicare fee-for-service patients using nonmedical workers and mobile technology. *Perspectives in Health Information Management*, *Winter*, 1-20.

[2] Ostrovskey, A. (2014). Community-based health coaches and care coordinators reduce readmissions using information technology to Identify and support at-risk Medicare patients after discharge. *Agency for Healthcare Research and Quality*. Retrieved from https:// innovations.ahrq.gov/ profiles/community-based-health-coaches-and-care-coordinators-reduce-readmissions-using-information

[3] Kasper, J., Watts, M. O., & Lyons, B. (2010). Chronic disease and co-morbidity among dual eligibles: Implications for patterns of Medicaid and Medicare service use and spending. Washington, DC: The Henry J. Kaiser Family Foundation.

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