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RESEARCH BRIEF

Place of Residence Affects Routine Dental Care in the Intellectually and Developmentally Disabled Adult Population on Medicaid

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Objective. To compare the likelihood of intellectually and developmentally disabled (ID/DD) adults receiving a dental cleaning across places of residence.

Data Sources. Medicaid and Minnesota's Medicaid Management Information System (MMIS) databases.

Study Design. All adults with DD assessments in MMIS in 2001–2002.

Data Extraction Methods. All completed DD assessments in 2001–2002 linked to Medicaid utilization data for same recipients for same years.

Conclusions. The most disabled individuals are generally least likely to receive a dental cleaning. Individuals living in their own or a family home are less likely to receive the procedure than those living in ICF/MRs or a group home, even after controlling for disability, with those living in a group home falling in between ICF/MR and own/family home residents. The level of preventive dental care that ID/DD adults receive in community settings may be inadequate, particularly for persons living in own homes or with family.

Key Words. Mentally retarded, developmentally disabled, residence, dental care, disability

BACKGROUND

Increased importance is being placed on the quality of health care received by people with intellectual and developmental disabilities (ID/DD). Dental care is especially important for persons with ID/DD, many of whom for various reasons (e.g., use of antiseizure meds, poor oral hygiene) are more susceptible to oral diseases (Krahn, Hammond, and Turner 2006). Oral ailments may lead

to other diseases, such as pulmonary infection and bacterial endocarditis (Fenton et al. 2003). Basic dental services are an effective preventive tool.

The importance of dental care for this population, however, is not matched by the quality of the care it receives. For example, Havercamp, Scandlin, and Roth (2004) found that 14.4 percent of adults with ID in North Carolina have not had a dental cleaning for at least 5 years (compared with 8 percent in the general population). According to the Shriver Center for Developmental Disabilities at the University of Massachusetts Medical School, oral disease is one of the conditions most likely to go undetected in people with ID/DD (as described in Voelker 2002). There are several contributing factors, such as a lack of trained and/or willing dental practitioners, inadequate insurance coverage and/or low reimbursements, and transportation (e.g., Hayden and Kim 2002; Reichard and Turnbull 2004).

It has been found that people with ID/DD living in community are less likely to receive preventive services and may be in worse health than those living in institutions (e.g., Rimmer, Braddock, and Marks 1995; Lewis et al. 2002). For example, Freedman and Chassler (2004) found that people living in a parent's/relative's home or in a group home are significantly less likely to have had a dental exam in the past 6 months than people who lived in an institutional facility (72.4 percent for relative's home residents, 82.1 percent for group homes, 87.9 percent for residents of institutions).

Living in community-based residences improves outcomes such as consumer choice, contacts with family and community integration, as well as service costs (Stancliffe and Lakin 1998). However, one of the advantages of institutions, which usually have a medical professional and perform many preventive medical services on-site, is the centralization of health care and oversight. Health care services for people with ID/DD have not advanced at the same rate as residential services.

If the problem of inadequate dental care is indeed more prevalent in certain residential settings (i.e., family homes and own homes), efforts to improve utilization and access should be focused on community-based residential options. However, existing studies exploring this issue have several persistent weaknesses: generally small sample size, convenience samples, and lack of adjustment for differential levels of disability likely to be found among

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people living in different residential settings. A person's level of disability can affect the likelihood of receiving dental services, as was found in one study of mothers of adults with DD (Pruchno and McMullen 2004).

Our study creates disability scales from available data and is thus able to control for it. It also uses a large sample consisting of all persons receiving ID/DD services in the state of Minnesota in a 2-year period.

METHODS

Two administrative databases were utilized for the analysis. Medicaid records for years 2001–2002 provided utilization data. Minnesota's Medicaid Management Information System database containing DD Screening Documents (form DHS-3067) for persons with ID/DD receiving Waiver or regular Medicaid (called Medical Assistance in Minnesota) services was used to create measures for the level of disability as well as place of residence. The DD Screening Document is completed to determine the level of care required for a person with a diagnosis of mental retardation or a related condition. It makes no distinction between people with a diagnosis of ID and people with a diagnosis of a DD (two related but different terms)—we thus use the terms interchangeably throughout the text. The document is filled out when a person is entering services; there are also mandatory periodic (e.g., annual) screenings, as well as screenings when service needs of the persons have changed or are anticipated to change in the near future. The DD Screening Document contains information on the person's diagnoses, functional strengths and needs, and current and planned services and residential arrangements.

There were 15,352 persons with DD Screening Documents in 2001–2002 who were at least 18 years old. For each recipient, the latest available DD screening document was selected. Based on that assessment, each recipient was assigned one of the residential options: family home, foster/group home, own home, or ICF/MR. Seven hundred and sixty-two people could not be assigned to one of these residences.

Next, Medicaid Analytic Extract (MAX) data for the years 2001–2002 were obtained for the above individuals. Medicaid files were searched for the following CPT procedure codes signifying routine dental cleaning: D1110, D1120, and D1205.

In order to control for the length of observation period, MAX Personal Summary Record data were used to extract the number of Medicaid eligibility months in the 12 months before the date of the DD Screening Document.

Fourteen thousand nine hundred and seventy-six people were eligible for Medicaid for at least 1 month before their latest screening.

Other control variables included age, gender (from DD Screening Document), and race (white/nonwhite) (from MAX Person Summary file).

ANALYSIS

Disability Scales

The DD Screening Document is a service-oriented assessment and is designed to assess the level of services a recipient needs. It does not include any conventional disability instruments (e.g., such as Activities of Daily Living). Nonetheless, the items on the document can be used to create useful scales that differentiate between, for example, physical disability and communication disability. We hypothesized several a priori disability domains and candidate assessment items (Table 1). All candidate items were rescaled to a common continuous scale, and factor analysis was performed using the selected assessments. Promax rotation was used, allowing the domains to correlate.

Factor analysis confirmed the a priori domains to a great extent, although it did suggest some adjustments. The resulting disability domains and the component DD Screening items were (1) Functional Disability, measured by the independent living skills items and self-preservation; (2) Physical Disability, measured by mobility, fine motor skills, and seizures items; (3) Communication Disability, measured by receptive and expressive communication items and hearing; (4) two subsets of Behavioral Disability—one consisting of behavior items that represent activities having legal repercussions (called Illegal Behavioral Disability) and the other consisting of challenging behavior items not having legal ramifications (called Legal Behavioral Disability).

We then formed simple additive disability scales by summing the domains' items. Cronbach α is a statistic commonly used as a measure of internal consistency (reliability) of a measurement instrument or a scale. It measures how well a set of variables or items measures a single unidimensional latent construct. α s were calculated for each disability scale and ranged from 0.60 to 0.89. α of 0.7 or higher is usually desired for a set of items to be considered a good scale, but a value of 0.6 is also often cited as sufficient for an exploratory study such as this one. In addition, we performed sensitivity analyses using all available DD Screening Documents. The factor structure was confirmed and the composition of domains followed the same pattern.

Table 1: A Priori Disability Domains and Candidate DD Screening Items

<i>A Priori Disability of Interest</i>	<i>DD Screening Item</i>
Physical Disability	Vision Seizures Mobility
Functional Disability	Fine motor skills Self-preservation Independent living skills items Self-care Daily living skills/house management Money management Community living Leisure and recreation
Behavioral Disability	Challenging (excess) behavior scales Eating nonnutritive substances (pica) Injurious to self Physically aggressive Verbally/gesturally aggressive Inappropriate sexual behavior Property destruction Runs away Breaks law Temper outbursts
Communication Disability	Hearing Receptive communication Expressive communication
Cognitive Disability	ICD-9 codes for level of mental retardation: 317—mild mental retardation, 318.0—moderate, 318.1—severe, 318.2—profound

Promax rotation used in factor analysis allowed the domains to correlate, but the correlations were not high enough (highest was around 0.6) to present multicollinearity issues when more than one disability scale was included in analysis.

To address a possible “threshold” effect, we categorized disability scales using none/mild/moderate–severe categories for illegal behavior disabilities and using quartiles for other disabilities. In addition, cognitive disability was derived directly from the ICD-9 mental retardation diagnosis and was categorized as mild/moderate/severe/profound.

Logistic Analysis

All analyses were performed using *SPSS*. Series of logistic regressions were fitted, starting with regressions examining the relationship between individual

disability scales and the probability of having a dental cleaning in the previous 12 months. The next model examined the probability in terms of place of residence. Finally, the last model combined disability scales and place of residence. All models also controlled for months of Medicaid eligibility, age, gender, and race.

RESULTS

Table 2 presents statistics describing living arrangements in terms of residents' disability levels, demographics, and proportion receiving dental cleaning in the previous 12 months.

Residents of ICF/MRs are on average oldest and residents of family homes youngest. The percentage of females is highest in own homes. The percentage of nonwhites is highest in family homes.

People living in own homes are least disabled across all disability domains. Those living in ICF/MRs are generally most disabled, followed by residents of foster/group homes. Those living with family tend to be less disabled than residents of own home and residents of group homes.

People living with family are also least likely to have had a dental cleaning in the prior 12 months (37.8 percent). ICF/MR residents and residents of foster/group homes are about equally likely to have had a dental cleaning (69.7 and 70.8 percent), followed by those living in their own homes (52.3 percent).

Table 3 presents the results of logistic regressions. Models 1–6 examine the effect of disability. The largest effect is by the level of functional disability. The odds of having had a dental cleaning are 80–90 percent higher for a person in the two lower quartiles than they are for a person in the highest quartile. Odds of having the procedure are 1.6 for those in lowest physical disability quartile as compared with the most physically disabled. Being in the most disabled communication disability quartile also lowers the odds (1.4–1.5 times for those in the two lower quartiles as compared with the highest quartile). Most cognitively disabled recipients are also least likely to have had a dental cleaning—the odds are about 1.3 for those with mild or moderate disability as compared with those with profound cognitive disability. Being most disabled in terms of both behavior disabilities, however, raises the probability. Age does not seem to be a significant predictor, and gender only marginally so. Race, however, is a significant predictor, with whites being more than twice as likely to have received the service than nonwhites.

Table 2: Descriptive Statistics

	<i>ICF/MR</i> (n = 2,271)	<i>Foster/Group Home</i> (n = 6,998)	<i>Family Home</i> (n = 4,067)	<i>Own Home</i> (n = 1,254)
Received dental cleaning in past 12 months	69.7% (n = 2,264)	70.8% (n = 6,983)	37.8% (n = 3,909)	52.3% (n = 1,194)
Age in years (mean [SD])	46.7 (14.1)	41.8 (14.9)	30.9 (13.0)	40.6 (12.6)
Percent white	95.6	93.9	83.6	86.3
Percent nonwhite	4.1	5.2	10.8	7.3
Percent female	45.7	43.3	44.4	53.8
Months of Medicaid eligibility in last 12 months (mean [SD])	11.3 (2.1)	11.8 (1.2)	10.8 (2.8)	10.0 (3.4)
Functional Disability (%)				
1st quartile	5.8	23.7	33.0	78.0
2nd quartile	23.2	31.4	30.4	17.3
3rd quartile	38.7	27.6	22.4	3.7
4th quartile	32.2	17.0	14.0	1.0
Physical Disability (%)				
1st quartile	19.1	29.7	32.6	51.0
2nd quartile	17.7	23.6	24.9	25.5
3rd quartile	24.0	22.0	20.1	15.9
4th quartile	38.3	23.9	21.4	7.4
Communication Disability (%)				
1st quartile	12.8	27.9	32.3	60.2
2nd quartile	16.2	23.2	23.6	21.0
3rd quartile	22.5	22.5	24.0	15.3

4th quartile	45.5	25.2	17.8	2.8
Legal Behavior Disability (%)				
1st quartile	18.0	18.8	37.7	42.5
2nd quartile	28.5	29.0	31.6	35.7
3rd quartile	24.6	21.8	15.0	15.2
4th quartile	28.8	30.3	15.4	6.7
Illegal Behavior Disability (%)				
None	60.5	58.9	74.6	75.6
Mild	27.4	26.1	17.3	18.8
Severe	11.8	14.8	7.8	5.6
Cognitive Disability (%)				
Mild	17.2	36.0	41.7	79.3
Moderate	22.3	26.7	33.4	12.8
Severe	26.1	19.0	14.2	1.6
Profound	33.5	16.0	6.3	0.3

Table 3: Logistic Models: Dental Cleaning and Disability

	<i>Odds Ratio (95% CI)</i>
Model 1: Functional Disability	
Functional disability quartile 1 [†]	1.77 (1.60–1.97)***
Functional disability quartile 2	1.90 (1.72–2.10)***
Functional disability quartile 3	1.49 (1.34–1.64)***
Functional disability quartile 4	Reference category
Months of Medicaid eligibility (per month)	1.30 (1.28–1.33)***
Age (per year)	1.000 (0.997–1.002)
Female	1.09 (1.01–1.16)*
White	2.22 (1.94–2.54)***
Model 2: Physical Disability	
Physical disability quartile 1	1.61 (1.47–1.77)***
Physical disability quartile 2	1.25 (1.13–1.37)***
Physical disability quartile 3	1.24 (1.12–1.37)***
Physical disability quartile 4	Reference category
Months of Medicaid eligibility (per month)	1.31 (1.28–1.33)***
Age (per year)	0.998 (0.996–1.001)
Female	1.09 (1.02–1.17)*
White	2.21 (1.93–2.53)***
Model 3: Communication Disability	
Communication disability quartile 1	1.48 (1.34–1.63)***
Communication disability quartile 2	1.37 (1.24–1.52)***
Communication disability quartile 3	1.14 (1.03–1.25)*
Communication disability quartile 4	Reference category
Months of Medicaid eligibility (per month)	1.31 (1.28–1.33)***
Age (per year)	0.999 (0.997–1.002)
Female	1.07 (0.998–1.148)
White	2.19 (1.91–2.51)***
Model 4: Legal Behavior Disability	
Legal behavior disability quartile 1	0.78 (0.71–0.86)***
Legal behavior disability quartile 2	0.84 (0.77–0.93)***
Legal behavior disability quartile 3	1.08 (0.97–1.20)
Legal behavior disability quartile 4	Reference category
Months of Medicaid eligibility (per month)	1.29 (1.27–1.32)***
Age (per year)	0.998 (0.995–1.000)*
Female	1.10 (1.03–1.18)**
White	2.20 (1.93–2.52)***
Model 5: Illegal Behavior Disability	
Illegal behavior disability—none	0.83 (0.74–0.93)***
Illegal behavior disability—mild	1.04 (0.92–1.18)
Illegal behavior disability—moderate/severe	Reference category
Months of Medicaid eligibility	1.29 (1.27–1.32)***
Age (per year)	0.998 (0.996–1.001)
Female	1.11 (1.04–1.20)**
White	2.19 (1.92–2.51)***

continued

Table 3. *Continued*

	<i>Odds Ratio (95% CI)</i>
Model 6: Cognitive Disability	
Cognitive disability—mild	1.26 (1.14–1.40)***
Cognitive disability—moderate	1.30 (1.17–1.45)***
Cognitive disability—severe	1.13 (1.01–1.28)*
Cognitive disability—profound	Reference category
Months of Medicaid eligibility (per month)	1.30 (1.28–1.33)***
Age (per year)	0.998 (0.995–1.000)*
Female	1.07 (1.00–1.15)
White	2.26 (1.97–2.59)***
Model 7: Residence	
Own home	0.64 (0.54–0.74)***
Foster/group home	0.89 (0.80–0.99)*
Family home	0.24 (0.21–0.27)***
ICF/MR	Reference category
Months of Medicaid eligibility (per month)	1.26 (1.24–1.29)***
Age (per year)	0.987 (0.985–0.990)***
Female	1.12 (1.05–1.21)**
White	2.01 (1.75–2.32)***
Model 8: Disability and Residence	
Own home	0.42 (0.35–0.50)***
Foster/group home	0.76 (0.68–0.85)***
Family home	0.19 (0.17–0.22)***
ICF/MR	Reference category
ADL disability quartile 1 [†]	1.75 (1.47–2.07)***
ADL disability quartile 2	1.75 (1.51–2.03)***
ADL disability quartile 3	1.37 (1.20–1.55)***
ADL disability quartile 4	Reference
Physical disability quartile 1	1.16 (1.03–1.32)*
Physical disability quartile 2	0.95 (0.84–1.07)
Physical disability quartile 3	1.00 (0.89–1.13)
Physical disability quartile 4	Reference
Communication disability quartile 1	1.38 (1.20–1.60)***
Communication disability quartile 2	1.25 (1.09–1.43)***
Communication disability quartile 3	1.09 (0.96–1.24)
Communication disability quartile 4	Reference
Legal behavior disability quartile 1	1.00 (0.88–1.13)
Legal behavior disability quartile 2	0.96 (0.86–1.07)
Legal behavior disability quartile 3	1.11 (0.97–1.25)
Legal behavior disability quartile 4	Reference
Illegal behavior disability—none	1.07 (0.93–1.22)
Illegal behavior disability—mild	1.10 (0.96–1.26)
Illegal behavior disability—moderate/severe	Reference
Cognitive disability—mild	0.96 (0.82–1.13)
Cognitive disability—moderate	1.11 (0.95–1.30)
Cognitive disability—severe	1.04 (0.91–1.20)
Cognitive disability—profound	Reference

continued

Table 3. *Continued*

	<i>Odds Ratio (95% CI)</i>
Months of Medicaid eligibility (per month)	1.27 (1.24–1.30)***
Age (per year)	0.988 (0.986–0.991)***
Female	1.11 (1.03–1.19)**
White	2.09 (1.80–2.43)***

†Lower quartile signifies lower level of disability.

*Significant at 0.05 level.

**Significant at 0.01 level.

***Significant at 0.001 level.

Model 7 shows the effect of place of residence. Residents of foster/group homes are only slightly less likely to have had a dental cleaning as residents of ICF/MRs (odds ratio of 0.9 only marginally statistically significant). Those living with families are markedly least likely to have received the service—odds of 0.2 as compared with ICF/MR residents. Those living in their own home are also less likely to have had the procedure—odds of 0.6 as compared with ICF/MR residents. Being older lowers the likelihood, as does being nonwhite. Being female slightly raises the likelihood.

Model 8 adds all the disability domains to the previous model. The patterns generally persist and gap between residents of ICF/MRs and other types of living arrangements widens. After controlling for disability, living in foster/group home lowered the odds of having received a dental cleaning to 0.8 as compared with those living in ICF/MRs. The odds of receiving the service for someone living in own home are 0.4 as compared with those living in an ICF/MR, after controlling for disability. The odds for those living in family home remained 0.2. As in previous model, being older lowers the likelihood, as does being nonwhite. Females are more likely to have received the service.

DISCUSSION

Several important results emerged from the analysis. With the exception of behavior disabilities, being more disabled generally lowers the recipient's likelihood of receiving a dental cleaning. The opposite effect that high behavior disability has is likely due to the fact that recipients with the most behaviors usually have more oversight and more people involved in their care.

The findings that living in community settings may decrease the likelihood of receiving preventive health care services are confirmed, even after controlling for levels of disability. The difference is particularly striking for those living with family and own homes. In fact, even those living in foster/group homes are slightly less likely to have received a dental cleaning than those who lived in an ICF/MR after their level of disability is controlled for.

These findings raise concerns. A severely disabled person should still be able to access dental services. A higher level of disability should not decrease a DD person's chances of getting a basic service such as dental cleaning. This discrepancy may be due to access barriers or value judgments.

Our study had limitations, but we do not believe them to be detrimental to our conclusions. We were able to capture only the procedures that were billed to Medicaid, so if a person had private insurance that paid for the dental cleaning or paid out of pocket, his/her dental cleaning was not captured in our data. However, as the vast majority of our sample had Medicaid coverage throughout the follow-up period and Medicaid is generally a more comprehensive plan than most other available plans, it is unlikely private insurance had a large role as a payer, especially for dental coverage. We looked at MAX data and found that about 15 percent of people living in a family home had private insurance during the follow-up period; the number of people who had private insurance coverage and lived in their own homes was small and did not differ from the number who lived in group homes. It is safe to conclude that while inability to capture private insurance utilization may skew our results, it cannot account for all of the differences we found.

There is also the issue of temporality. Utilization was measured over a period of time, whereas a person's living situation could be assigned at one point in time. An individual may not have remained in the same setting during the entire follow-up period. However, data indicated that "moving" occurred relatively infrequently (about 7 percent of cases) and is not likely to significantly affect the result. When consumers changed residences, the majority moved from a less staff-intensive residential option to a more staff-intensive one (e.g., from family home to group home). We performed sensitivity analyses by assigning residence at beginning of follow-up and also by creating an indicator variable for a person moving, and our conclusions were unaffected. In fact, assigning residence at the end of follow-up may lead to underestimating the gap between some of the residence types.

A basic limitation in any study looking at utilization of a particular service is the difficulty of linking the service with health outcomes. We do not attempt to draw definitive conclusions that people with ID/DD who received a

dental cleaning have better dental or medical outcomes. However, if the level of care provided at institutions such as ICF/MRs is the standard, then the level received in community settings is inadequate. Resources should be provided to individuals with ID/DD and their families to insure that they are able to access community-based dental care, including transportation, education, appointments, staffing, etc. Community-based care improves quality of life and many outcomes; it should not come at a price of decreased quality of dental care.

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