

**MINNESOTA MEDICAID BUDGET CUTBACKS 2010 AND IMPACT ON  
DENTAL SERVICE UTILIZATION IN NURSING HOME RESIDENTS**

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## **DEDICATION**

To my parents and sister, who always taught me that hard work and determination is the way to success, and to my wife, Richa Arora Grover, for all her love and support throughout these years.

## **ABSTRACT**

### Background and Objectives

Oral health is an integral part of maintaining the overall health of every individual and therefore an essential component of primary health care for older adults. Oral health service utilization is multifactorial and financial support plays an important part in determining the degree of oral care received.

Past studies report a strong association between dental insurance coverage and dental service utilization by the elderly population. The purpose of this study was to examine the effects of a reduction in dental insurance for enrolled nursing home residents under Minnesota's Medicaid plan in 2010. As part of research hypothesis, it was theorized that Minnesota's Medicaid budget cuts, which took effect in January 2010, resulted in a reduced utilization of basic dental services among nursing home residents.

### Material and Methods

For this study, a retrospective cross sectional survey method was employed and data were collected from the dental practice software systems used in University of Minnesota's two community-based dental clinics for older adults. The Experimental Group included subjects above 55 years, who were nursing home residents and had dental visits between January 2009 and December 2010 and had any type of Medicaid dental coverage. The Comparison Group included subjects above 55 years of age who were nursing home residents and had dental visits and did not have any Medicaid dental insurance for the same time period. Outcome variables analyzed were dental services provided for MA and non-MA groups in three categories depending upon the changes that occurred after

the 2010 Minnesota Medicaid cutbacks. These were: 1) non-impacted, services; 2) reduced services; or 3) eliminated services. Summary dental utilization measures such as overall visits, overall services, as well as visits per patient per year and services per patient per year were also analyzed.

## Results

For the Experimental (MA) group, no or marginally statistically significant differences were found from 2009 to 2010 in overall dental visits and overall services, although large and statistically significant increases were found in overall visits and services provided for the Comparison (non-MA) group in 2010 versus 2009. No statistically significant differences were found in both MA and non-MA groups for total visits per patient and total services per patient from 2009 to 2010. For those dental services unaffected by the 2010 Minnesota MA benefit changes, no statistically significant changes occurred from 2009 to 2010 for either the MA or non-MA groups. However, large and statistically significant reductions were found from 2009 to 2010 for dental services that were reduced in coverage in the 2010 Minnesota MA dental benefit cutbacks, and extremely large reductions were found for eliminated services in 2010. These reductions in reduced or eliminated dental services during 2010 occurred in both the Experimental (MA) and Comparison (non-MA) Groups.

## Conclusion

While the overall process of care in these two practices seemed unchanged based on overall visits and services per patient provided in 2009 and 2010, an expected increase in overall dental services and visits occurred among the non-MA patient group in 2010

perhaps to compensate for fewer covered MA services. While no statistically significant differences were found from 2009 to 2010 in utilization of services that were unaffected by the 2010 Minnesota MA service cutbacks as might have been expected, large and significantly different reductions in utilization were found in both the MA and non-MA groups for services that were either reduced or eliminated in 2010. While these results might be a reflection of the US economic downturn during the same time period, they also could suggest that the MA service cutbacks might have led to changes in dental providers' perceptions of all NH patients' ability to pay for these services in 2010. Future larger sample studies with a broader time frame are required to further investigate the effects of 2010 Medicaid benefit cutbacks on dental care utilization, as well as further analyses of changes in specific dental services provided.

Keywords: Medicaid, Dental Care, Dental Services, Oral Health, Utilization, Nursing

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## **CHAPTER I: INTRODUCTION**

### **Background**

Like the rest of the world, the United States is an aging society (1). The definition of an elderly person has been described differently by various organizations utilizing different criteria. According to the World Health Organization (WHO), a chronological age of 65 and above is accepted to be the definition of an elderly person by most developed countries (1). However, the Bureau of Health Professions has defined elderly as “a population with health care conditions and needs which differ significantly from those of younger people, which are often complicated by the physical, behavioral, and social changes associated with aging” (2).

The elderly proportion of the US population is significant and is the fastest growing segment in the nation. In 2010 the US Census Bureau estimated the US elderly population as comprising approximately 13% of the total population, growing from 12.4 per cent in the year 2000 (3). Bearing in mind the available data, this makes up to roughly one out of every eight American citizens. It is expected that by the year 2030, there will be about 72.1 million elderly persons, more than twice their number in 2000. As for the state of Minnesota alone, the elderly population as in 2011 was estimated to be approximately 13.1 per cent of the total population, which is equivalent to the US national average (4, 17).

In 2003, the Centers for Disease Control and Prevention (CDC) reported the number of elderly retaining their natural teeth to be steadily increasing over the past decades. They estimated that with this improved dentition, the focus will shift to added utilization of dental services by the elderly (5). Considering the presence of numerous chronic medical conditions in the elderly, there will be an altered range of dental conditions as compared to the younger segment of the society.

Older adults are now more inclined and motivated to maintain their natural teeth into their later years, although they may experience an increase in oral health problems in old age (6). As a result, there is an increasing number of older persons have some or all of their teeth intact. This is thought to be the result of improvements in oral health care, such as community water fluoridation, advanced dental technology, and better oral hygiene practices, as well as increased utilization of professional dental services (6). Consequently, epidemiologic trends suggest the increasing need for dental services by older adults. Nevertheless, considering their complex medical conditions and complications, this population is at risk of chronic diseases of the mouth, including dental infections (e.g., caries, periodontitis), tooth loss, benign mucosal lesions, and oral cancer (7).

The residential status of some elderly citizens plays a vital role in determining the degree of dental services provided. According to the US Surgeon General's Report (2000), at any given time, five percent of Americans aged 65 and older (currently about 1.65 million people) are living in a long term care facility where dental care access is of major concern (8). All of these residents have unique health issues and experience different patterns and prevalence of oral diseases and take prescription, over-the-counter, (OTC) or a combination of both types of medications. Many commonly used medications usually have some associated side effects such as dry mouth (xerostomia). Dry mouth along with poor oral hygiene can result in further deterioration in the health of the individual. According to current available data, elderly residents in US long term care facilities are prescribed an average of eight medications, making this scenario more likely (9).

Despite factors contributing to poor oral health, dental utilization rates remain lower for older adults compared to younger age groups. The reported barriers to utilization of dental services include factors such as high cost of dental services; lack of perceived need for care, transportation issues to or from the dental clinic, patient anxiety level and also the lack of motivation either by the patient, family members or both (10).

## **Dental Insurance for the Elderly**

From the US Medical Expenditure Panel Survey, 1996 (MEPS), evidence indicates that socioeconomic background and other demographic factors were associated with having a preventive dental visit with a dentist or dental hygienist. These factors also influence the per-person number of preventive visits by type of dental practitioner (11). Therefore; dental insurance coverage plays a significant role in insuring regular dental visits for better preventive services.

However, Medicaid (Title XIX) does not provide dental benefits for adults in most states, though it may cover some dental treatment based on state-by-state policies. As compared to all the insurance coverage available for the elderly population, Medicaid or Medical Assistance (MA) is the largest of Minnesota's publicly funded health care programs serving the elderly (12). It is a jointly funded program employing both state and federal dollars and per the data available since 2008-09, Medicaid covered approximately 14-15 per cent of the Minnesota's total population (including children, adults and elderly) and about 16 per cent of the USA population (State Health Facts, MN, 2008-09), thus reinforcing its importance in achieving and maintaining good general health and oral health for a significant portion of the US and Minnesota population.

Although the majority of older adults live independently in the community, there is growing number of elders with special health needs who may require long-term care services either at-home, in supportive housing, or in institutions such as skilled nursing facilities. Nursing home residents have significantly greater dental care needs, and experience more barriers receiving dental care compared to independent older individuals (9). A substantial percentage of older adults in Minnesota's nursing home are on Medicaid and through 2009; the Minnesota Medicaid program covered a comprehensive set of dental services for enrolled adults, including the elderly in nursing homes. Covered services include most routine preventive and diagnostic dental services, along with restorative, oral surgery, prosthodontics, and endodontic services (as defined by the procedural codes by the American Dental Association {ADA}).

Accordingly, basic preventive and diagnostic services such as oral hygiene instructions, fluoride applications, dental radiographs, dental prophylaxes (cleanings), and complete and periodic oral evaluation were covered. Also, behavioral management procedures for adults, such as those with cognitive impairment, to ensure the safety and effectiveness of dental care were also covered. Most regular dental treatment modalities such as extractions (simple and surgical), endodontic treatment for both anterior and posterior teeth, periodontal therapy and removable denture services were included. Considering the importance of usability of dentures in the elderly, repairs and relining of

partial and complete removable dentures were also included. However, crowns, orthodontic treatment and implants were only available in a very limited basis to meet the specifications of the utilization criteria by the Minnesota Health Care Program (MHCP) provider guidelines (12).

### **Budget Cutbacks and Services Reduction for the Elderly**

Due to the national economic downturn starting in 2008 and a large Minnesota state budget deficit, budget cutbacks in Minnesota's Medicaid program took effect in January 2010 and dental coverage for adults was specifically targeted. According to the Dental Coverage Limitations and Policy Changes issued on September 30<sup>th</sup> 2009 by the Minnesota Department of Human Services (13), several modifications were introduced in the services that were earlier covered. Diagnostic services, such as periodic dental exams, were limited to once a calendar year instead of twice a year, and comprehensive dental evaluation was limited to once in five years. The number of dental x-rays, such as periapical films and bite wings, were reduced to four per day of the service and the full mouth radiographic series was eliminated.

Significant benefit changes also occurred in preventive dental services. Oral prophylaxis and fluoride varnish applications were limited to once per calendar year as compared to twice per year before 2010. The reimbursement rates for some of the



restorative procedures such as restoration of posterior teeth using composite material were reduced to the rates of amalgam, and endodontic services were limited only to treatment of anterior or bicuspid teeth, with molars excluded from coverage. Further, all denture repairs and relines were eliminated as benefits in 2010. Thus, Minnesota budget cutbacks significantly affected some of the basic treatment options offered by dentists to their adult patients with Medicaid dental coverage. This helped form the basis of our research focus, which was to study the change in pattern for dental service utilization by nursing home residents covered by Medicaid versus other payment sources.

## **OBJECTIVES**

The objective of the current study was to investigate the relationship between Minnesota's Medicaid 2010 dental coverage cutbacks and dental services utilization among nursing home residents 12 months prior (January 2009- December 2009) and 12 months after (January 2010- December 2010) Minnesota's Medicaid dental benefit cutbacks. Findings of this study should provide valuable information on the implications of such benefit changes for dental health programs and services for the elderly. The findings will also include recommendations for future studies and therefore serve as an evidence base for them.

## CHAPTER II: LITERATURE REVIEW

### 1. Elderly and Dental Conditions

There have been numerous publications exploring the prevalence of diverse dental conditions based on the age of patients. Cited here are six of the many publications which point out the dental health issues faced by elderly. Researchers have noted an increase in dental service requirements of the elderly after controlling for factors such as complex medical conditions and place of residence.

US Surgeon General David Satcher (2000) in his report 'Oral Health in America' underlined some key issues such as aging and its impact on long term oral health and systemic conditions of the elderly. He stated that a large percentage of the immunocompromised elderly residing either in long term care (LTC), or hospitals have a higher likelihood of being diagnosed with oro-facial disorders than the typical elderly population in the community. He also mentioned the possible connection between periodontal disease and other systemic conditions such as diabetes, cardiovascular disease and stroke (8). Also, elderly people with partial or complete dentures may regularly complain of wide-ranging problems such as having concerns with their eating, social interaction and even communication. Overall, all these problems do have negative impact on their quality of life (39).

Haumschild et al. (2009) also mentioned the existing correlation between the general health of the elderly residing in long term facilities like nursing homes, assisted living, etc. and oral inflammation. This correlation is considered to be 'bi-directional' as established by the fact that more than hundred medical or systemic conditions can have manifestations of their symptoms in the oral cavity (18). Nearly 33 percent of senior

adults with natural teeth complain of untreated tooth decay and approximately 56 percent suffer from some form of untreated periodontal disease. These findings suggest that daily oral hygiene and regular check-ups by a dental professional should be an integral part of the overall treatment for the frail elderly (40).

Likewise, Guay (2005) in his work discussed the shift of oral health status for the residents of various long-term care facilities. He stressed the role of better information systems to update patients, families and other concerned parties. This article also mentions the Omnibus Budget Reconciliation Act (OBRA) of 1987 as far as provisions for Medicare and Medicaid coverage related to the standards for care in nursing home settings. Guay also emphasized the requirement to complete the Oral Status and Disease Prevention component (Section L) of the Minimum Data Set (MDS) 2.0 by nursing home caregivers in order to provide better oral care to residents (16).

In the “State of Decay” (2003), the authors tried to highlight the gap between the required oral care and the actual fulfillment of the necessary dental treatment by the American elderly population. The authors also identified the adverse effects of multiple medications on the oral health of the elderly and limited access of dental care by the institutionalized population (19).

Further supporting this information, Dolan, et al. (2005) utilized data from the National Health Interview Survey (NHIS) and Medical Expenditure Panel Survey (MEPS) and discussed various barriers faced by the elderly in receiving any dental health care (10). She also discussed the reduced utilization of dental services by the elderly either due to lack of private insurance or inability to finance dental care out-of-pocket. With the growing ‘Baby Boomer’ segment of US society, there will be an immense

burden on the private insurance companies and government programs taking care of the healthcare financing requirements for elders (10).

Gonsalves, et al. (2003) also discussed the role of the patient's physician in improving the overall oral health of elderly patients with continuous monitoring, early detection of oral lesions and timely intervention. In addition, the authors mentioned factors such as reduced saliva, poor oral hygiene, and institutionalization as potential factors resulting in dental caries in the elderly population (7). The oral health care for the residents of nursing homes often presents a daunting challenge particularly to the individuals relying on their caregivers for maintaining their daily oral health. Considering this shift in the responsibilities, monitoring of the oral health status of elderly residents becomes even more important (7).

## **2. Oral-Systemic Connections**

According to the latest statistics, out of the six leading causes of death in the United States, "five of these chronic diseases have been linked directly or indirectly to untreated periodontal disease" (38, 40). Regardless of the statistics that several oral diseases affecting the long-term care or homebound elderly are either avoidable or curable, many residents do not seek accessible treatment, or their dental needs are not given high priority (14).

In contrast to past conceptions that oral health had little influence on overall health, research has now been performed to study the impact of systemic and oral conditions on each other. There has been extensive work done in order to provide more evidence towards the direct connection between the body and the oral cavity. The authors

have explained the importance of continuing oral health in the maintenance of a healthy body and vice versa (8, 20, 21, 22).

Scannapieco (1999) discussed the association between periodontal diseases and respiratory disorders such as aspiration pneumonia and other nosocomial infections, especially in the institutionalized elderly. In addition the author also discussed the role of various salivary enzymes in the “adhesion and colonization” by respiratory pathogens. The nursing home residents with their reduced resistance to infection are considered to be most vulnerable segment of our society (8, 20, 23).

In the same way, Zoellner (2011) suggested a strong association between periodontal infection and increased risks for various cardiovascular diseases. According to this data, incidence of infective endocarditis is found to be higher in patients with immune-compromised status as compared to normal counterparts (24).

Moreover, Kamera, et al. (2008) suggested the possible impact of periapical inflammation on the central nervous system (CNS) possibly contributing to conditions such as Alzheimer’s disease (AD). Moreover, these authors also proposed several likely mechanisms to potentially associate chronic periodontitis with the clinical onset and advancement of AD (25).

The connection between the periodontal disease and common joint disorders such as rheumatoid arthritis (RA) was discussed by Persson (2012). The author proposed the development of “autoimmune antibodies” in patients with RA in association to the presence of bacteria *P. gingivalis* found in periodontal infections (27).

As far as possible correlations between oral and systemic health, studies have also been conducted to provide evidence of the impact of various systemic conditions on

oral health. Mealey (2006) explained this correlation and discussed the possible oral manifestations from many systemic conditions. He projected the growing rate of diabetes mellitus (DM) in today's American society could possibly have a direct impact in increased oral infections such as gum inflammation (gingivitis) and potential alveolar bone loss (periodontitis). Moreover, he also highlighted some mechanisms to explain the strong link between other metabolic disorders and resulting periodontal infections (26).

Saito, T. & Shimazaki, Y. (2000) elaborated on the connection between obesity and periodontal disease. They proposed possible association between lipid and glucose metabolism with various periodontal infections. The authors also recommended conducting elaborate studies to study the impact of several liver disorders directly or indirectly on periodontal infections (36).

Overall, emerging evidence has suggested a link between the chronic oral inflammation and overall general health of the patient. The oral cavity is in fact the visible gateway for rest of the body and can possibly give an indication, thus reflecting the dynamics of the internal organs (18).

### **3. What is Medicaid?**

According to a Minnesota House of Representatives report (2011) "Medical Assistance (MA) or Medicaid is a jointly funded, federal-state program that pays for health care services provided to low-income individuals. It was established by the US Congress in 1965 as part of Title 19 of the Social Security Act" (28). Medicare and Medicaid are two of the largest US government plans providing financial support for health care in our society. Medicare provides health care coverage for all US older adults

regardless of financial need, but does not provide any significant dental coverage. Medicaid provides health care coverage for those with low income, including children, adults and seniors (28). Per current statistics, Medicaid covers 29 million poor and near-poor children and seven million additional low-income children are covered under the State Children's Health Insurance Program (SCHIP) (44). Whereas, approximately 4.6 million low-income seniors, nearly all of them also enrolled in Medicare are covered under Medicaid health plans (45).

**i. Federal role**

Per US federal law, basic health care services are required to be provided by all respective states to all qualified sections of society, including low income individuals. The costs of all the services provided, with the option of additional services covered under the Medicaid, are partially reimbursed by the Federal government to the individual states. The Center for Medicare and Medicaid Services (CMS) is the agency under the US Department of Human and Health Services (DHHS) that governs Medicaid at the Federal level. DHHS is also in charge for issuing required protocols and procedures with regard to Medicaid for all states to follow (28).

**ii. State role**

It is important to note that even though all state Medicaid programs are governed under the federal regulations, supplementary criteria for individual Medicaid programs are established at the state level (29). Subsequently, Minnesota Department of Health Services (DHS) is accountable for Medicaid (known in Minnesota as MA) program management and execution of policies at the state and county level.



### iii. **Differences between Medicare and Medicaid**

It is important to understand the fundamental differences between Medicare and Medicaid health coverage, which are often confused. The key differences are as follows:

1. Medicare is a Federal and insurance program that serves primarily people above 65 years of age. On the other hand, Medicaid is an assistance program financed partially from the Federal, state and other local tax funds. It serves low income people of all ages who qualify for the assistance programs conditional upon state policies.

2. Medicare is managed by the federal government's Centers for Medicare & Medicaid Services (CMS) and has uniform policies all over US. In contrast, Medicaid is a joint Federal-State program with some oversight by CMS, but is primarily administered by the state government, and policies may vary from state to state while still remaining within federal guidelines.

3. For Medicare, qualifying people pay a portion of the costs through deductibles for their hospital visits and other associated expenses. For additional expenditures, payments are required to be paid by the patients every month. However, as Medicaid serves low-income residents, qualified people usually do not pay any costs for their covered services. In some cases, they may need to pay a small co-payment depending upon the utilization of services and income level (41, 42).

### iv. **Eligibility**

To be eligible for Minnesota Medicaid, an individual essentially should meet the following criteria:

1. Be a citizen of the US or a non-citizen who meets specified criteria

2. Be a resident of Minnesota
  3. Be a member of a group for which MA coverage is required or permitted under federal or state law
  4. Meet program income and asset limits, or qualify on the basis of a “spend down”
- Eligibility for most enrollees is also re-determined every six to 12 months from the time of enrollment (12, 28, 29).

v. **Medical Assistance (MA) Expenditures**

The Minnesota State Health Facts by the Henry J. Kaiser Family Foundation (2009) estimated Medicaid coverage of approximately 18 per cent of the Minnesota population under various insurance plans as compared to 20 per cent of the whole US population (30). This report also stated the total Minnesota Medicaid spending for the year 2010 to be \$7.59 billion (FY2010) which was calculated to be approximately 2 per cent of the total US Medicaid expenditure for the same fiscal year. The federal government shared \$4.67 billion or 61.4 per cent of this total expenditure as compared to 67.7 per cent on a national scale, and the State of Minnesota assumed the remaining \$2.93 billion or 38.6 per cent of the total expenses for the given year (31).

vi. **Reimbursement**

Under Medicaid, enrolled healthcare providers and institutions are required to bill the state in order to receive reimbursement for their services provided to qualified recipients. The providers are then paid per set reimbursement rates under state law for the individual services provided. Under the ‘fee-for-service system (FFS)’, MA eligible beneficiaries

(with some exceptions), are permitted to receive services from any participating medical provider (12, 32).

The States decide the reimbursement rates considering the following factors;

- The costs of providing the service
- A review of what commercial payers pay in the private market
- A percentage of what Medicare pays for equivalent services (32)

As a prerequisite, the providers are required to agree to accept Medicaid payment including associated co-payments, as payment in full in return for services delivered to MA-eligible patients.

It is now clear that Medicaid plays a very important role assisting people with the utilization of healthcare services. People in low socio-economic groups are heavily dependent on the Medicaid programs offered by their State governments. Unfortunately, financing dental care for older persons is particularly difficult compared with other age groups because Medicare does not have any policy that covers routine dental services, and only 24 per cent of older persons are covered by any private dental insurance in 2004 (15).

#### **4. Medicaid and Dental Service Utilization**

Medicare policies to provide only medical insurance and drug coverage to nearly all elderly Americans along with no dental coverage leads to distortions in the timing of dental service utilization. This time lag leads to worsening oral health and thus the overall health of the individuals (43). Medicaid, on the other hand, serves as an important complement to Medicare by assisting low income Medicare beneficiaries with

their Medicare premiums and cost-sharing. It also provides coverage for prescription drugs and long-term care (LTC) services that are not available through Medicare, but may only provide limited dental coverage for adults based on policies that vary from state-to-state. Without Medicaid's assistance, the costs of basic medical care can impede access to care and erode financial security for low income elderly people (33). Thus, dental care is unreachable for many older persons living on a fixed income. Consequently, ineligibility for dental insurance and other financial barriers can reduce access to available dental services, leading to further oral health complications (8). Research has also shown that disadvantaged patients are more likely to experience untreated oral health problems and associated discomfort adversely affecting a patient's well-being and overall quality of life (34).

Recent changes implemented in state Medicaid policies resulting in reduced coverage for many essential dental services for the elderly appear to have increased the use of emergency departments by low income people for their dental problems (34). The Surgeon General's Report (2000) also mentioned patients suffering from conditions including tooth loss, temporal-mandibular disorders and "functional limitations of prosthetic replacements" thus leading to reduced ability to bite, chew, and even swallow foods. All of these factors can lead to poor nutrition due to improper food selection (8). Without fundamental changes in the long-term financing for low income adults, including the elderly, we can anticipate an increased economic burden of unmet needs that will impact both federal and state governments (35). According to the recent report released by Minnesota's Office of the Legislative Auditor (OLA), there exist significant concerns over the dental services provided under the Minnesota Medical Assistance program. It

includes poor policies and methods to reimburse MA dental providers along with low reimbursement rates as compared to other states. This directly results in low motivation among the dental community to provide dental services to the special care patients covered under MA (37).

Clearly, since there has been much editorializing and many assumptions about the impact of state Medicaid budget cuts on dental care access and utilization, it seems critical to objectively evaluate outcomes when this type of event takes place. Thus, this investigation was undertaken to explore the influence of the Medicaid dental coverage cutbacks that were implemented in Minnesota effective January 1, 2010 on the dental service utilization of a sample of nursing home residents served by the Amherst Wilder Foundation Senior Dental Program in St. Paul and the Walker Dental Clinic, Walker Methodist Health Center, Minneapolis.

## CHAPTER III: MATERIALS AND METHODS

### 3.1 Study Design

This study employed a cross-sectional, retrospective design based on existing data from clinical records. After IRB review, an exempt status was granted by the University of Minnesota along with approval from both community clinic sponsors contributing data for this study, the Amherst H. Wilder Foundation in St. Paul, and Walker Methodist in Minneapolis.

Cross-sectional designs are a valuable and commonly used method to explore the prevalence of an outcome of interest for subgroups of a population at a given time. However, this design is limited by the fact that it is carried out at isolated time points and gives no indication of the sequence of events that may have occurred as can be obtained via longitudinal designs (50). But for reasons of practicality and time constraints, this approach was employed for this study to provide initial information on the study question which concerned Medicaid policy changes that took effect in 2010 and their impact on dental service utilization by nursing home residents.

### 3.2 Study Population

The subjects in this study were seen in two University of Minnesota School of Dentistry-affiliated community-based dental clinics serving older adult, including nursing home residents. These two clinics were:

1. Walker Dental Clinic (WDC) is a dental practice located within the Walker Methodist Health Center (WMHC), Minneapolis, Minnesota. It is supported jointly by the WMHC and the University of Minnesota, School of Dentistry

and serves older adults (ages 55+) from Walker as well as other long-term care facilities and community-dwelling patients.

2. Wilder Senior Dental Clinic (WSDC) was a community-based dental clinic for the older adults (ages 55+) located in St. Paul that was jointly operated by the Amherst H. Wilder Foundation, St. Paul, Minnesota and the University of Minnesota, School of Dentistry until the end of 2010, when this site was closed and merged with another community clinic sponsor.

The sampling frame for this study consisted of all WSDC and WDC patients who were seen between January 1, 2009 and December 31, 2010 according to electronic dental records. This initial population was then electronically sorted to create the patient samples incorporated into this study after application of the inclusion criteria below.

Sample Inclusion Criteria:

1. Patients at WSDC or WDC during 2009 and/or 2010
2. Nursing home residential status during 2009 and/or 2010

Sample Exclusion Criteria:

Community-dwelling or other non-nursing home residents (e.g. assisted living, adult day services)

### **3.3 Major Variables**

The major variables employed in this study were related to the time frame in which patients received dental services, whether these services were covered under Medicaid or not, and various measures of dental care utilization.

A. Independent Variables

1. Calendar year 2009 vs. 2010 (when new Medicaid coverage restrictions took effect)
2. Presence of Medicaid dental coverage vs. other payment sources (i.e. other insurance or private pay)

B. Dependent (Outcome) Variables (Dental Service Utilization)

1. Overall visits per year and per patient
2. Overall dental services provided per year and per patient
3. Specific types of dental services provided based on changes in Medicaid coverage effective in 2010 as follows:
  - Selected services that were not changed after 2010 cutbacks (“Non-impacted services, including:
    - All amalgam restoration services (A1, A2, A3, A4)
    - Anterior teeth composite restoration services (AC1, AC2, AC3, AC4)
    - Bite wing radiograph services (BW1, BW2, BW3, BW4)
    - Limited oral examination (LOE)
    - Extractions (EXT, EXS)
  - Services that were reduced after 2010 cutbacks (“Reduced services”), including:
    - Recall visits
    - Adult prophylaxis
    - Topical fluoride application



- Services that were eliminated after the 2010 cutbacks (“Eliminated services”), including:
  - Denture repairs and relines
  - Full mouth x-rays

C. Potential co-variables/confounders

1. Patient age
2. Patient gender
3. Patient health and functional status (e.g. number of chronic diseases, disabilities)
4. Medication use
5. Socio-economic status (e.g., income, educational level)
6. Race/ethnicity

### **3.4 Data Collection and Preparation**

In late 2012 and early 2013, a cross-section of patient information and dental utilization data for calendar years 2009 and 2010 was obtained from the WSDP and WDC. Computerized patient data were downloaded from EagleSoft® dental practice management software in use at both clinics. This included patient demographic characteristics, residential status, insurance coverage (if present), and dental service utilization. Service utilization data included both visits and specific dental procedures based on ADA procedure codes (13).

To fulfill IRB requirement for exempt human subject research, subjects were de-identified by removing all patient identifiers except for first name and patient identification number. Eaglesoft® data was then converted into Excel® spreadsheets and

stored on secured computers used by the PI and faculty supervisors. The total number of patients was initially sorted into two groups depending upon residential status as either nursing home (NH) or non-nursing home (Non-NH).

Nursing home residents in WDC master files were identified by their nursing home residential address or room designation. Similarly, nursing home residents in WSDC master files were also identified via nursing home residential addresses in the Twin Cities metropolitan area. A combined data file was then prepared to aggregate eligible patients from 2009 and 2010 from both clinics for analysis.

Nursing home residents were then further segregated based on their payment source for dental services. The Experimental Group (EG) in this study was defined as all nursing home residents having Medicaid/Medical Assistance (MA) dental coverage with dental services provided in either 2009 and/or 2010. The Comparison Group (CG) consisted of all nursing home residents who did not have any form of Medicaid dental coverage (e.g. other insurance or private pay) for dental services received during the years 2009 and/or 2010 in the two study clinics. For the verification of essential patient details such as residential status (nursing home vs. non-nursing home), insurance plans (MA vs. Non-MA) and to resolve any possible discrepancies or inconsistent data, verification was done by direct inspection of patient master files collected from the study clinics' electronic dental records.

In summary, files containing basic patient demographic, address on record, payment methods as well as treatment transaction dates were scanned to verify and delete any transaction occurring in a year other than 2009 or 2010. The patient ID/demographic

information were linked to the treatment transaction file and treatments provided to the study groups (MA & Non-MA) were isolated to create a new file. At this point, the treatment transaction dates were re-examined to ensure that transactions were dated as 2009 or 2010. Data sorting and identification of Experimental and Comparison groups is illustrated in Figure 1.

To study the impact of MA insurance coverage changes on dental service utilization, all dental procedures performed for both the EG and CG were further tabulated for years 2009 and 2010. After identifying these two groups, Excel® patient data files were used to extract all procedures performed on the associated subset of patient ID numbers. Dental procedures were then further segregated in the three different categories as outlined previously, focusing on the most common dental procedures provided to older adults that were impacted by the 2010 Minnesota Medicaid dental coverage changes.

### **3.5 Data Analysis Models and Rationale**

This study compared the change in dental service utilization by nursing home residents after the Minnesota Medicaid cutbacks that were introduced in 2010 using the following models and rationale:

	2009 Utilization	2010 Utilization
MA PATIENTS	Y1a	Y2a
NON-MA PATIENTS	Y1b	Y2b

Where:

*Y1a: MA dental utilization in 2009*

*Y2a: MA dental utilization in 2010*

*Y1b: Non-MA dental utilization in 2009*

*Y2b: Non-MA dental utilization in 2010*

- Null hypothesis ( $H_0, 1$ ):  **$Y1a - Y2a = 0 = Y1b - Y2b$**   
(Utilization between 2009 and 2010 was the same for both MA and non-MA patients.)
- Alternative finding 1:  **$Y1a - Y2a > Y1b - Y2b$**   
(Suggests that MA cutbacks led to lower utilization in 2010 for only MA patients)
- Alternative finding 2:  **$Y1a - Y2a = Y1b - Y2b > 0$**   
(Suggests lower utilization in 2010 for both MA and non-MA patients)

After collection and tabulation of the required data, different measures were used as outputs (dependent variables) to assess the impact of Medicaid dental cutbacks on dental service utilization by the nursing home patients in 2009 and 2010. These output variables were selected to assess the impact of the 2010 Medicaid service cutbacks from as many meaningful viewpoints as possible. These were:

- A. Utilization by total services and services provided for the EG and the CG and also per patient in 2009 and 2010.
- B. Utilization of specific service category types as outlines previously (Non-Impacted, Reduced or Eliminated) for the EG and the CG patient in 2009 and 2010.

## **Chapter IV: DATA ANALYSIS**

The overall study sample as well as the Experimental and Comparison Groups were evaluated and compared using descriptive statistics such as averages and frequency distributions. For all measures of service utilization such as visits and services, the percentage change between 2009 and 2010 was calculated for both the EG and the CG. Statistical differences were then calculated using chi-square (QuickCalcs, GraphPad software) and student t-tests (Microsoft office Excel statistical software) with a statistical significance level set at  $p \leq 0.05$ .

## CHAPTER IV: RESULTS

### 4.1 Characteristics of Population and Sample

A total of 848 patients out of total 2122 seen in years 2009 and 2010 were included for the final analyses. Table 1.1 summarizes demographic information of the participants. Of the participants in Walker Clinic, 71.4 percent were females compared to 59.7 per cent seen at the Wilder Clinic. The average age of the participants was 83.36 years for Walker and 75.57 years for Wilder. Considering the similarity in the demographics, data from the two individual clinics were combined for further analysis. Since data on ethnic minorities was not available from the electronic dental records, it was not included for analysis. The gender percent and average age used for the study represents the average percentage of both the clinics.

Table 1.2 compares the study sample with characteristics of Minnesota nursing home residents as reported in the Center for Medicare and Medicaid Services, Minimum Data Set (MDS) 2.0 (46) for the years 2009 and 2010 on the basis of gender. The study sample was 29.6 percent male and 70.4 percent female as compared to 30.7 and 69.3 percent respectively for Minnesota MDS at that time.

Table 1.3 summaries the average age distribution for the study population and compares it with the data from the Minnesota MDS 2.0 (43) for the years 2009 and 2010. The average age distribution for the study population was similar to Minnesota averages for almost all the age groups. However, some variation was observed in the patients in 85-95 age group which was 46.3 percent in Minnesota but 37.1 percent in the study sample.

#### **4.2. Overall Visits**

Table 2 summarizes the results for overall visits to the dental clinics during the study period. For the total 960 patient visits in the year 2009, 636 visits were patients with MA and 324 were non-MA patients. There was a statistically significant 5.2 percent increase ( $X^2=12.872$ ,  $p=0.0049$ ) from 2009 to 2010 in total overall visits. An increase of 28.4 percent ( $X^2=11.438$   $p=0.0007$ ) was observed for non-MA patients in 2010, but a 6.6 percent reduction ( $X^2=1.434$   $p=0.2311$ ) for MA patients that was not statistically significant.

#### **4.3. Overall Services**

Table 3 presents overall services provided to subjects during the study period. For the total 1860 procedures performed in 2009, 1220 procedures were provided to MA patients and 640 were for non-MA patients. There was an increase of 2.6 percent overall ( $X^2= 19.897$   $p=0.0002$ ) in 2010. Along with a rise of 23.3 percent ( $X^2=15.536$   $p=0.0001$ ) for non-MA group, a statistically significant decrease of 8.3 percent ( $X^2=4.361$   $p=0.0368$ ) was observed for the MA group.

#### **4.4. Visits/Patient/Year**

Table 4 summarizes the results of the two-tailed t-tests conducted to compare the visits per patient for the MA and non-MA groups assuming independent samples with equal variance. There were no statistically significant differences observed between visits per patient in either study group during the study period.

#### **4.5. Services/Patient/Year**

Table 5 shows the results of two-tailed t-tests conducted to compare the services performed per patient for years 2009 and 2010. The samples were assumed to be independent with equal variance. No statistically significant differences were observed in the average number of services per patients during the study period from 2009 to 2010.

#### **4.6. Non Impacted services**

Table 6 summarizes the results for services that were not impacted by Minnesota Medicaid cutbacks in 2010. For the total 384 procedures performed in 2009, 227 were provided to patients with MA and 157 procedures were for the non-MA patients. In 2010, there was an increase of 7.3 percent ( $X^2=4.473$   $p=0.2147$ ) observed for both the MA and Non-MA groups which was not statistically significant. An 18.9 percent increase ( $X^2=3.720$   $p=0.0538$ ) for the MA patients and a 9.6 percent drop ( $X^2=0.753$   $p=0.3857$ ) was observed for the Non-MA patients. While the increase for the MA group approached statistical significance, neither of these utilization measures yielded a two-tailed t-test with a p-value less than 0.05.

#### **4.7. Reduced Services**

Table 7 shows the results for services performed under the reduced services category. For the total 704 procedures performed in 2009, 438 services were provided to MA patients and 266 procedures were provided for non-MA group. In 2010, there was an overall drop of 25.6 percent ( $X^2=26.932$ ,  $p=0.0001$ ) in services provided with a statistically significant reduction of 28.1 percent ( $X^2=20.092$ ,  $p=0.0001$ ) for the MA group and 21.4 percent ( $X^2=6.840$ ,  $p=0.0089$ ) for the Non-MA group.



#### **4.8. Eliminated Services**

Table 8 summarizes the services provided under the eliminated services category. A total of 137 procedures were performed in 2009, 94 of which were provided to patients with MA and 43 procedures for non-MA patients. In 2010, a steep and statistically significant decline of 70.1 percent ( $X^2=52.364$ ,  $p=0.0001$ ) was observed for procedures that were eliminated from MA coverage in 2010. Utilization of these services was reduced by 73.4 percent ( $X^2=40.008$ ,  $p=0.0001$ ) in the MA group and 62.8 percent ( $X^2=12.356$ ,  $p=0.0004$ ) in non-MA group, both of which were highly statistically significant.

## CHAPTER V- DISCUSSION

### 5.1 Population and Sample

Prior to discussing the specific findings of this study, some characteristics of the subjects warrant comment. The project attempted to study the impact of the Minnesota Medicaid Cutbacks that took effect in 2010 on dental service utilization by nursing homes residents. The subjects studied were a highly specific group selected as a convenience sample from two community clinics with available data on those subjects.

The inclusion criteria led to observation of a limited group of patients out of a total of 2122 potential patients initially present in the two clinics master files who received dental services in 2009 and/or 2010. Only 848, or 39.9 percent, were subsequently included as the sample for final analyses based on study inclusion criteria. This sample consisted of 29.6 percent males and 70.4 percent females, which is similar to the proportion of males and females found among Minnesota nursing home residents in federal MDS 2.0 data for 2009 and 2010. Due to the lack of information on ethnicity in clinic electronic dental records, this aspect of the study sample could not be directly assessed. However, summary data on patients served by the two study clinics as provided by their sponsors indicated that approximately 12 percent of subjects at the Walker clinic and 17 percent at the Wilder clinic were ethnic/racial minorities including African American, Hispanic, Native American or Asians/Pacific Islanders.

The ages of the subjects in this study (mean age= 82.7 years) were generally slightly older than Minnesota MDS 2.0 nursing home data for the same time period (mean age=80.3 years). Subjects were selected from two dental clinics serving the elderly

population in the Twin Cities metropolitan area and since the sample of nursing home residents was small, it may not be a representative of the Minnesota or US nursing home resident populations. That being said, however, there were no major age or gender related differences identified between this study sample and Minnesota data except for the percentage of “old-old” patients, suggesting that the sample used was generally comparable to Minnesota nursing home population. For the 848 patients enrolled for the study, 465 patients (54.83%) had Medical Assistance (MA) coverage compared to patients who were either covered by other insurance plans or were private pay (45.16%). Thus, MA insurance was a more prominent payment source especially among the nursing home residents, although this is also typical among Minnesota nursing home residents (47).

It was also not possible to directly access medical information for the study sample from the Eaglesoft® patient data analyzed for this study. Many confounding factors such as medical status, number of medications and functional dependency on patients can potentially affect their dental service utilization. Obtaining this information would have required abstraction from other record systems which was not feasible during the time available for this study. However by limiting the study to nursing home residents, we would tend to control for these characteristics, which presumably would be similar for most nursing home residents due to eligibility criteria for placement in this setting. Comparing the average age groups, gender ratio and payment resources with the Minnesota MDS nursing home data, we think the subjects were probably a homogenous group in respect to their nursing home status and very similar to the general Minnesota nursing home population.

## **5.2 The Research Findings**

This study was conducted to evaluate the impact of 2010 Minnesota Medicaid budget cutbacks on utilization of dental services provided to nursing home residents. As explained in the Method section earlier, various output variables were evaluated to determine the impact of the 2010 Medicaid service cutbacks from as many meaningful viewpoints as possible. They ranged from summary measures such as overall visits and services provided, to more specific dental services categorized by whether they were eliminated, reduced or unchanged after the 2010 changes to the Minnesota Medicaid dental benefit set. Each of these utilization measures will be discussed in turn using the analytical framework outlined earlier to compare dental utilization in 2009 and 2010 by calculating the percentage change that occurred and whether that change was statistically significant or not.

### **5.2.1 Overall Dental Visits**

For the MA group, a reduction in overall visits of 6.6 percent ( $p$ -value=0.2311) was observed from 2009 to 2010 but was not statistically significant. These results seem understandable given that fewer dental services were covered by MA in 2010 which could have slightly lowered visits, although a large proportion of dental services were still covered so that these individuals could continue to seek care.

While visits for MA patients from 2009 to 2010 were largely unchanged, we found a substantial increase of 28.4 percent ( $p$ -value=0.0007) in 2010 for non-MA patients that was statistically significant. This suggests that patients paying for services via other insurance plans or out-of-pocket continued to seek care, and perhaps these dental

practices compensated for the potential decrease in available MA dental coverage and patients by providing more visits for non-MA patients. Availability of third party coverage is a well-known driving force for the patients to use dental services (Goodman et al., 2005), so it would be expected that practices might compensate for fewer patient visits under MA dental coverage by providing visits for more patients with other payment sources. It is also important to note, however, that visits do not necessarily reflect cost, so simply because non-MA patient visits increased does not tell us about the financial impact on those patients or the practices studied here.

### **5.2.2 Overall Dental Services**

As was the case for overall visits, overall service utilization by the MA group was slightly decreased (8.3%) in 2010 compared to 2009 (p-value=0.0368), while services for non-MA patients were found to be 23.3 percent (p-value=0.0001) higher in 2010 than in 2009. Both of these changes were statistically significant, although the change for the MA group was more marginal. This decrease for MA patients' service utilization seems logical given the fact that some commonly utilized services for older adults were reduced or eliminated in 2010 and might therefore require more out-of-pocket payments either by these MA patients or their responsible parties for care at these clinics.

The larger and statistically significant increase in services observed for the non-MA group in 2010 supports the view that more services were provided for patients paying out-of-pocket or via other insurance plans. Thus, it seems likely that these dental practices tried to compensate for the reduction in MA dental coverage among their patients by scheduling and providing more services for non-MA patients.

### **5.2.3 Visits per Patient**

It was interesting to find that no statistically significant differences were found in visits per patient per year for either the MA or no-MA groups from 2009 to 2010. This suggests that the overall process of care for the clinics involved in the study did not change as a result of the change in MA dental coverage in 2010 and the same number of visits per patient per year were generally provided regardless of patient payment source. This seems reasonable if the overall structure of practice and volume of patients for these clinics remained the same and suggests that although more visits occurred among non-MA patients, a similar number of patients was likely scheduled during clinic practice days in 2009 and 2010, and the number of patients treated in a day may have remained the same.

### **5.2.5 Services per Patient**

Similar to the visits per patient per year category, there was no statistically significant difference present in the service per patient per year for either the MA or no-MA patients from 2009 to 2010. This indicates that there may have been no change in the overall services provided to patients regardless of their payment sources during the study period. Thus it is possible that even with an increase in the number of non-MA patients scheduled in 2010, the number of providers, length of appointments and services provided during appointments remained the same in the two study clinics despite the overall change in proportion of MA versus non-MA patients visits and services.

### **5.2.6 Utilization of Non-Impacted Services**

A 7.3 percent increase (p-value=0.2147) was observed in overall services that were not impacted by the 2010 Minnesota Medicaid dental service cuts for the entire study sample during the study period, which was found not to be statistically significant. Services such as anterior and posterior amalgam restorations, anterior composites, simple and surgical extractions, bite wing x-rays and limited oral examinations were representative of this service category. There was an increase of 18.9 percent (p-value=0.0538) observed for the MA group which was close to statistically significant and a drop of 9.6 percent (p-value=0.3857) observed for the non-MA group that were not statistically significant.

This seems likely due to fact that the MA and non-MA patients continued utilization of services such as extractions, fillings, or individual dental x-rays as these were probably the most essential services for any patient. These services appear to have remained unchanged among MA patients, thus not affecting their overall utilization. As for the non-MA patients, the relative importance of these services in maintaining quality of life may still have been important leading to similar utilization of these services in 2009 and 2010. Also, providers would not tend to treatment plan these procedures differently since they may have been considered the most essential and still covered for the MA group.

### **5.2.7 Reduced Services**

An overall reduction of 25.6 percent (p-value=0.0001) was observed for the entire study sample in the representative set of services with reduced MA dental coverage

between 2009 and 2010, such as recall visits, periodic cleanings and topical fluoride applications. A 28.1 percent decrease (p-value=0.0001) was observed for the MA group and a 21.4 percent (p-value=0.0089) decline was observed for the non-MA group in 2010. This result seems understandable for the MA group because of their decreased access to these services in 2010 compared to 2009. For example, MA coverage for preventive services such as periodic exams and cleanings was reduced in 2010 from two times per year to one time per year, thereby halving MA patients' opportunities for those services in these clinics during that year compared to 2009, unless they or their responsible parties chose to pay for additional exams and cleanings out-of-pocket.

However, the fact that similar decrease in these services occurred in the non-MA group warrants further consideration. One possibility is that the change in MA benefits was adopted as the standard for all treatment plans by all dental providers regardless of the presence of MA dental coverage. Considering that MA dental coverage guidelines in the initial half of 2010 were somewhat unclear after the cutbacks began on January 1, 2010, it seems possible that providers may have used the 2010 MA dental benefit set as their default approach when treatment planning both MA and non-MA patients, especially if a patient's payment source was unclear as might be the case for new nursing home residents. By using this approach, providers may have been attempting to reduce the chances of their patients receiving unexpected bills and increasing clinic accounts receivable for services that may not have been covered or for which a patient or their responsible party had not agreed to pay. This phenomenon of using dental insurance benefits as default treatment planning guidelines is not unusual in dentistry. For example, the widespread adoption of six month interval for periodic dental exams and cleaning in



US dental practice was not the result of scientific research, but rather is thought to have originated from toothpaste advertising campaigns which then was subsequently adopted as a benefit standard by US dental insurance carriers dating back to 1950's and 1960's (48,49).

Another possibility was that the use of these services was reduced in non-MA patients due to effects of the general economic climate during the study period. A marked economic recession began in the United States in December 2007 and became international in September 2008. This was characterized by high unemployment rates, sharp increases in oil and food prices with a heavy economic burden on the US working class. As a result, this economic melt-down possibly had a direct impact on the lifestyle of many patients and their responsible parties resulting in possible reduced dental service utilization for services that required out-of-pocket payment. However, if this was the case, it seems a bit surprising that there was not a larger and statistically significant reduction in utilization of services unaffected by the 2010 MA cutbacks in the non-MA group, unless those services were considered more essential, as mentioned earlier.

#### **5.2.8 Eliminated Services**

Study results revealed that some of the dental services that were eliminated under the MA coverage changes in 2010 (e.g., denture repairs, relines, full-mouth x-rays) suffered the highest drop in service utilization. An overall decrease of 70.1 percent (p-value=0.0001) was observed between 2009 and 2010 for the overall study sample and utilization by the MA group was down by 73.4 percent (p-value=0.0001) and by 62.8 percent (p-value=0.0004) for the non-MA group.

This was a remarkable finding that seems to highlight the importance of insurance coverage in making dental services accessible for patients, especially those with limited resources. By 2009-2010, the impact of the worldwide economic crisis was felt by US state and local governments which saw a reduction in their tax revenues and the accumulation of large budget deficits. It was these large state budget deficits that led to reductions in state health and human services budgets across the US, including Minnesota, and eventually led to state Medicaid budget cuts. While some of the eliminated dental services, such as repairs and relines of dentures may still have been used by some MA patients to maintain oral comfort and function, the majority of these patients apparently chose to forgo these services in 2010 probably due to lack of affordability.

As was the case for the reduced services discussed previously, the sharp reduction in the use of these services by non-MA patients may also have been a reflection of possible changes among dental providers who may have been using the 2010 MA insurance benefits as treatment planning guidelines for all patients. This may have been due to their concern about securing payment for these services, especially for patients whose payment sources may have been unclear. Thus, the possible inability to pay out-of-pocket, or even a perception by dental providers of a possible inability to pay out-of-pocket among both MA and non-MA patients may have proven to be the driving force behind their utilization of dental services in this study, especially for those services that were reduced or eliminated as a result of the 2010 Minnesota MA dental benefit changes. Interestingly, the fact that most denture repairs and relines have fees comparable to the services included in the non-impacted service category and which did not decrease to a

statistically significant degree in 2010 tends to support the notion that treatment planning decisions rather than general economic factors may have been a more influential factor in the utilization of these services by the non-MA group in 2010.

## **Chapter VI: CONCLUSIONS**

The present study represents an initial effort to study the impact of 2010 Minnesota Medicaid benefit cutbacks on dental service utilization by nursing home residents. Since this study involved a relatively small sample of NH residents from only two dental clinics, caution is necessary in generalizing these results to other populations. Based on this preliminary data and analyses, we found mixed results as far as the null hypothesis that dental utilization was unchanged after these Medicaid benefit changes took effect. No statistically significant differences were found from 2009 to 2010 for some utilization measures, such as overall dental visits and overall services in the MA group, as well as for services and visits per patient per year in both groups and for dental services unaffected by the 2010 Minnesota MA benefit changes. However, increases in both visits and services per year occurred in the non-MA group, suggesting possible compensation by providers for lower MA patient utilization in these practices during 2010. Strong evidence to reject the null hypothesis was also found for other utilization measures studied here – 2010 MA cutbacks appeared to significantly impact dental utilization for services that were either reduced or eliminated in the 2010 Minnesota MA dental benefit cutbacks, and this effect was felt by both MA and non-MA nursing home residents.

The MA patients studied here seem to have been heavily dependent on the services covered under their insurance plans and seldom motivated to pay out-of-pocket if a service was not covered. The non-MA patients studied demonstrated similar patterns of decreased service utilization as NH residents for some of the services groups studied. These results could have been a reflection of the potential role of the US economic climate on decisions to pay out-of-pocket by both MA and non-MA patients along with their responsible parties during the study period. The steep decline seen in the utilization of reduced and eliminated category services by the non-MA group also could have been a reflection of dental providers' perceptions of NH patients' ability to pay for services during the treatment planning process, especially when the payment source for services provided may have been unclear.

Future larger sample studies would be needed to refine the variables employed here and to further investigate the effects of Medicaid benefit cutbacks on utilization of dental services by nursing home or other vulnerable populations. More focus may also be needed on changes in the pattern of utilization for specific services rather than categories of services. A broader time frame would also help in analyzing and understanding the role of US economy on the decisions of patients and their responsible parties as far as dental service use. It would also be helpful to collect data from other states besides

Minnesota, so as to analyze and compare the impact of Medicaid cutbacks on nursing home residents on a larger scale.

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## TABLES

**Table 1.1. Characteristics of Subjects**

	<b>WALKER</b>	<b>WILDER</b>	<b>TOTAL</b>
<b>TOTAL NUMBER OF CLINIC PATIENTS (2009 and 2010)</b>	1452	670	2122
<b>NH PATIENTS</b>	776	72	848
<b>NON-NH PATIENTS</b>	676	598	1274
<b>NH MEDICAID PATIENTS (Experimental Group)</b>	437	28	465
<b>NH NON-MEDICAID PATIENTS (Comparison Group)</b>	339	44	383
<b>GENDER</b>	MALE - 28.6% FEMALE -71.4%	MALE -40.3% FEMALE -59.7%	MALE- 29.6% FEMALE- 70.4%
<b>AVERAGE AGE</b>	83.36 years	75.57 years	82.7 years

**Table 1.2. Comparison of Study Sample with MDS 2.0 Minnesota NH Data (Gender)**

	<b>Minnesota NH Residents (MDS 2.0)</b>	<b>Study Sample</b>
<b>MALES</b>	30.7%	29.6%
<b>FEMALES</b>	69.3%	70.4%

**Table 1.3. Comparison of Study Sample with MDS 2.0 Minnesota NH Data (Age Distribution)**

<b>AGE GROUP (Years)</b>	<b>Minnesota NH Residents (MDS 2.0)</b>	<b>Study Sample</b>
< 65	8.7%	9.3%
65-74	10.4%	14.6%
75-84	26.6%	27.4%
85-95	46.3%	37.1%
> 95	8.0%	11.6%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>

**Table 2. Overall Visits**

	<b>2009 visits</b>	<b>2010 visits</b>	<b>%Change</b>	<b>Chi Square (X<sup>2</sup>)</b>	<b>p-value</b>
<b>MA patients</b>	636	594	-6.6%	1.434	0.2311
<b>Non-MA patients</b>	324	416	28.4%	11.438	0.0007
<b>Total</b>	960	1010	5.2%	12.872	0.0049

**Table 3. Overall Services**

	<b>2009 Services</b>	<b>2010 Services</b>	<b>%Change</b>	<b>Chi Square (X<sup>2</sup>)</b>	<b>p-value</b>
<b>MA patients</b>	1220	1119	- 8.3%	4.361	0.0368
<b>Non-MA patients</b>	640	789	23.3%	15.536	0.0001
<b>Total</b>	1860	1908	2.6%	19.897	0.0002

**Table 4. Visits/Patient/Year**

	<b>2009 Visits/Pt. average</b>	<b>2010 Visits/Pt. average</b>	<b>% Change</b>	<b>p-value (two-tailed)</b>
<b>MA patients</b>	3.57	3.43	-3.92%	0.7383
<b>Non-MA patients</b>	3.33	3.53	6.00%	0.4548

**Table 5. Services/Patient/Year**

	<b>2009 Services/Pt. average</b>	<b>2010 Services/Pt. average</b>	<b>% Change</b>	<b>p-value (two-tailed)</b>
<b>MA patients</b>	6.85	6.47	-5.55%	0.6462
<b>Non-MA patients</b>	6.34	6.69	5.52%	0.4153

**Table 6. Non-Impacted Services**

	<b>2009 Services</b>	<b>2010 Services</b>	<b>% Change</b>	<b>Chi-square (X<sup>2</sup>)</b>	<b>p-value</b>
<b>MA Patients</b>	227	270	18.9%	3.720	0.0538
<b>NON-MA Patients</b>	157	142	-9.6%	0.753	0.3857
<b>TOTAL</b>	384	412	7.3%	4.473	0.2147

**Table 7. Reduced Services**

	<b>2009 services</b>	<b>2010 services</b>	<b>% Change</b>	<b>Chi Square (X<sup>2</sup>)</b>	<b>p-value</b>
<b>MA patients</b>	438	315	-28.1%	20.092	0.0001
<b>Non-MA patients</b>	266	209	-21.4%	6.840	0.0089
<b>TOTAL</b>	704	524	-25.6%	26.932	0.0001

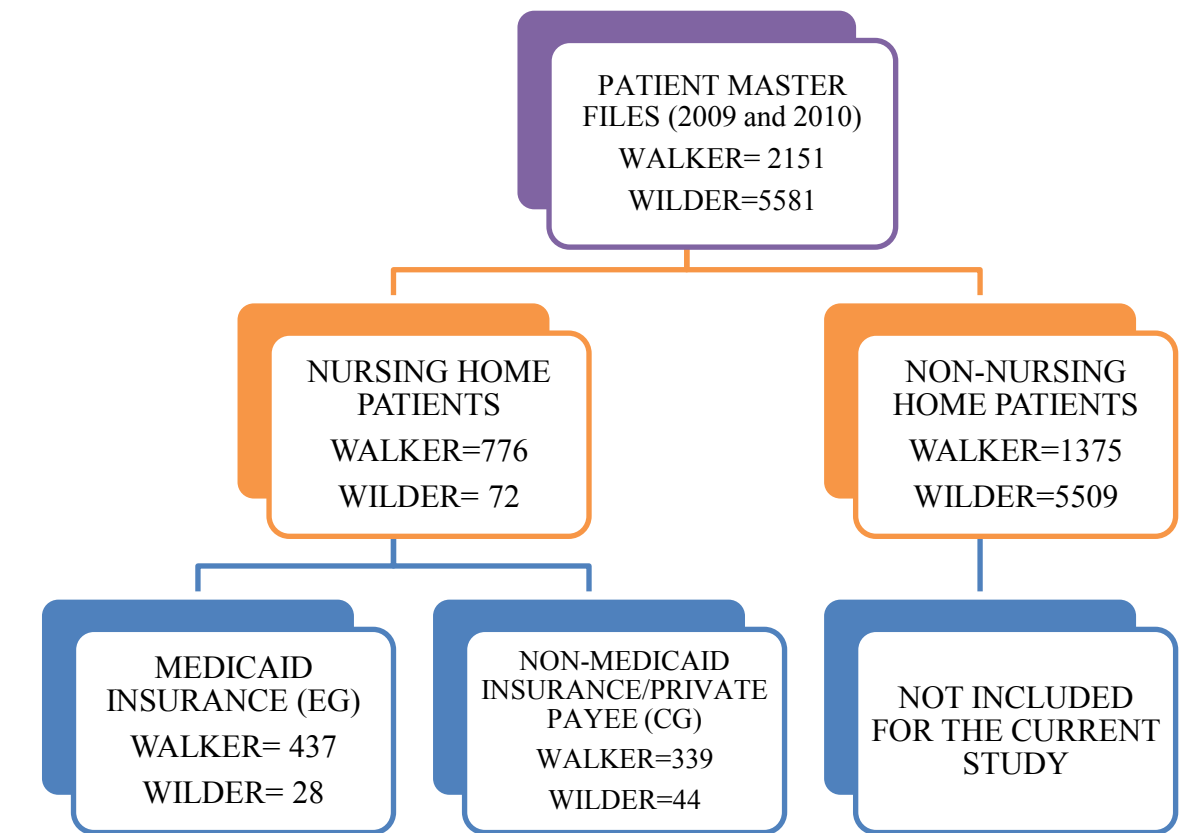
**Table 8. Eliminated Services**

	<b>2009 services</b>	<b>2010 services</b>	<b>% Change</b>	<b>Chi Square (X<sup>2</sup>)</b>	<b>p-value</b>
<b>MA patients</b>	94	25	-73.4%	40.008	0.0001
<b>Non-MA patients</b>	43	16	-62.8%	12.356	0.0004
<b>TOTAL</b>	137	41	-70.1%	52.364	0.0001



**FIGURES**

Figure 1: Data sorting and identification of Experimental and Comparison groups



**APPENDIX: IRB APPROVAL LETTERS*****University of Minnesota (Page 1)***

Section 2:

TO : shuma001@umn.edu, grove267@umn.edu,

The IRB: Human Subjects Committee determined that the referenced study is exempt from review under federal guidelines 45 CFR Part 46.101(b) category #4 EXISTING DATA; RECORDS REVIEW; PATHOLOGICAL SPECIMENS.

**Study Number:** 1203E11144

**Principal Investigator:** Satbir Grover

**Title(s):**

Impact of Minnesota 2010 Budget Cuts on Dental Utilization in Nursing Homes.

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This e-mail confirmation is your official University of Minnesota HRPP notification of exemption from full committee review. You will not receive a hard copy or letter. This secure electronic notification between password protected authentications has been deemed by the University of Minnesota to constitute a legal signature.

The study number above is assigned to your research. That number and the title of your study must be used in all communication with the IRB office.

If you requested a waiver of HIPAA Authorization and received this e-mail, the waiver was granted. Please note that under a waiver of the HIPAA Authorization, the HIPAA regulation [164.528] states that the subject has the right to request and receive an accounting of Disclosures of PHI made by the covered entity in the six years prior to the date on which the accounting is requested.

If you are accessing a limited Data Set and received this email, receipt of the Data Use Agreement is acknowledged.

This exemption is valid for five years from the date of this correspondence and will be filed inactive at that time. You will receive a notification prior to inactivation. If this research will extend beyond five years, you must submit a new application to the IRB before the study's expiration date.

*University of Minnesota (Page 2)*

Upon receipt of this email, you may begin your research. If you have questions, please call the IRB office at (612) 626-5654.

You may go to the View Completed section of eResearch Central at <http://eresearch.umn.edu/> to view further details on your study.

The IRB wishes you success with this research.

We have created a short survey that will only take a couple of minutes to complete. The questions are basic, but will give us guidance on what areas are showing improvement and what areas we need to focus

on: <https://umsurvey.umn.edu/index.php?sid=94693&lang=um>

*Walker Methodist Health Center*

May 11, 2012

Dr. Satbir Grover

Re: Proposal to Conduct a Study of "Minnesota's 2010 Medicaid Coverage Changes and Dental Service Utilization by Nursing Home Residents"

Dear Dr. Satbir:

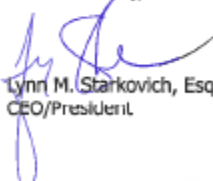
Thank you for responding to our request to clarify how you intend to manage protecting the personal identifiers in your study.

We have reviewed and approved your proposal to conduct a study on the changes in dental service use in long-term care residents using a de identified file.

Please be sure to notify me about any changes in your study protocol.

Best wishes for a successful research project.

Yours Sincerely,



Lynn M. Starkovich, Esq.  
CEO/President



## Amherst H. Wilder Foundation



AMHERST H  
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EXECUTIVE DIRECTOR  
Paul Mattessich

MEMO

TO: Dr. Satbir Grover

FROM: Richard A. Chase, Ph.D., Chair, Wilder Foundation Research Review Committee

RE: Proposal to conduct a study of "Minnesota's 2010 Medicaid Coverage Changes and Dental Service Utilization by Nursing Home Residents"

DATE: April 5, 2012

Thank you for responding to the Foundation's Research Review Committee's request to clarify in your proposal about the use and protection of personal identifiers.

The Committee reviewed and approved your proposal to conduct a study the changes in dental service use in long-term care residents using a new data file provided by Wilder staff that will be de-identified.

This approval is based on the dataset being de-identified prior to you receiving it and the approval of Wilder's Aging Services Director.

Please be sure to notify me about any changes in your study protocol.

Best wishes for a successful research project.