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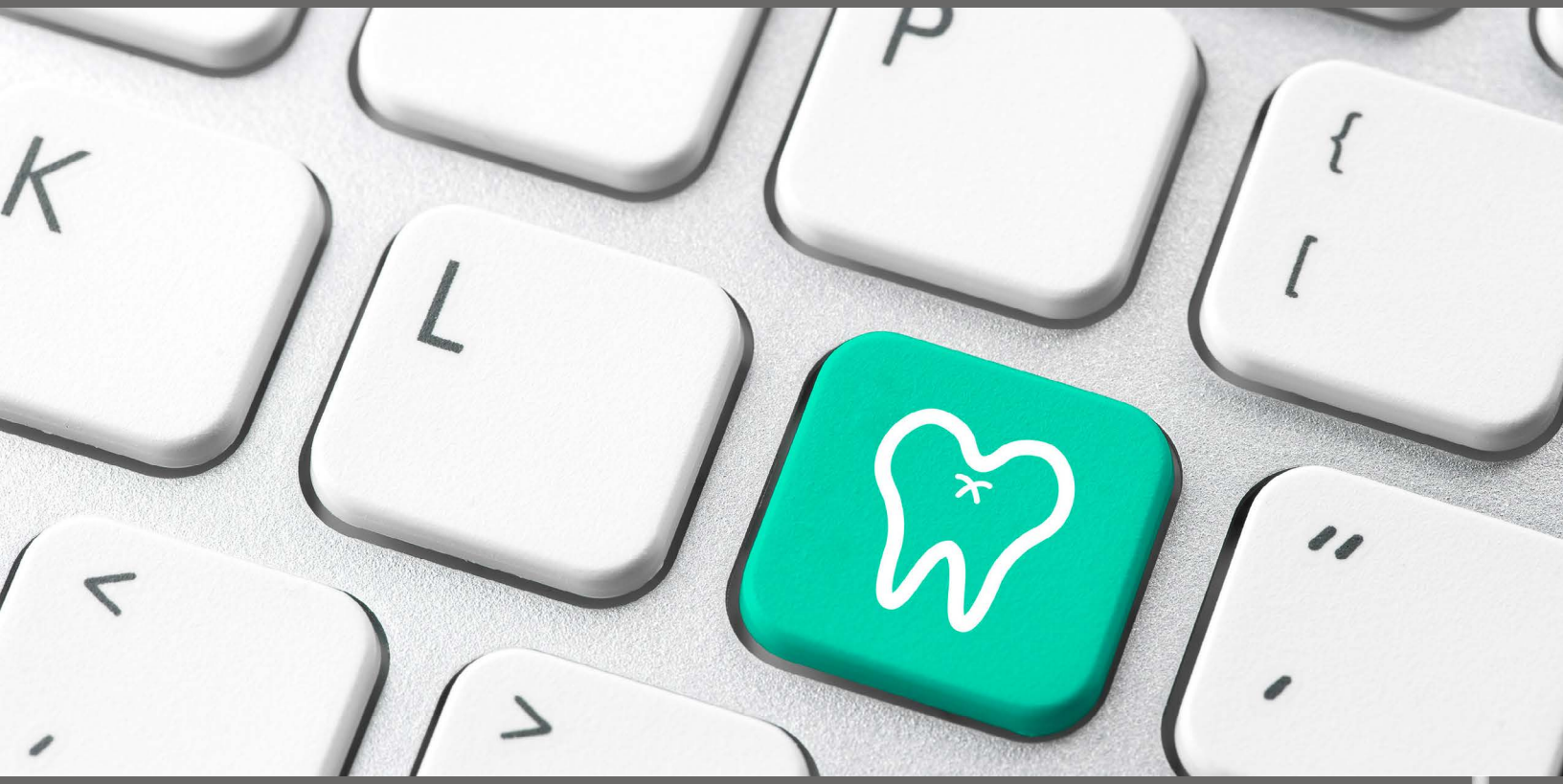

Evaluation of Provider Network in the Iowa Dental Wellness Plan, 2014-2016

Susan McKernan
Assistant Professor
*Preventive & Community Dentistry***

Mark Pooley
Research Scientist
*Health Policy Research Program**

Aparna Ingleshwar
Graduate Research Assistant,
*Health Policy Research Program**

Elizabeth Momany
Assistant Director, Health Policy Research Program
*Associate Research Scientist**

Peter Damiano
*Director**
*Professor, Preventive & Community Dentistry***

* *University of Iowa Public Policy Center*
** *University of Iowa College of Dentistry and Dental Clinics*

University of Iowa Public Policy Center •209 South Quadrangle, Iowa City, IA 52242-1192
O - 319.335.6800 • F - 319.335.6801 • www.ppc.uiowa.edu

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Overview

This report is one of a series that evaluates the Dental Wellness Plan (DWP) provider network adequacy; previous reports examined network adequacy at baseline[1] and at the end of the first program year[2]. This current report describes the dentist network during the second year of the DWP, May 2015 through April 2016. We also make comparisons with Year 1 (May 2014 – April 2015) to describe changes over time, where appropriate.

The two main types of outcomes considered in this evaluation include dentist supply measures (e.g., dentist ratios) and distance measures (e.g., distance to the nearest dentist). Comparisons are made between DWP members, members of the traditional Medicaid State Plan (MSP), and Delta Dental of Iowa (DDIA) commercial beneficiaries.

Study Population

- The Year 2 study population included 161,353 DWP members, 114,327 MSP members, and 451,950 DDIA members. The study population was limited to individuals with valid addresses for purposes of geospatial network analysis (i.e., distance outcomes).
- MSP members were more likely to be female (67%) compared to DWP (54%) and DDIA (52%) members.
- DWP members had a younger age distribution than both comparison groups, with mean age of 37 and 20% of members over the age of 50.
    - MSP: mean=39 years, 26% over the age of 50.
    - DDIA: mean=40 years, 31% over the age of 50.

Dentist Supply Measures

- The number of contracted providers in the DWP network increased steadily from May 2014 through May 2016. As of May 2016, there were 697 contracted DWP network providers.
    - Number of contracted dental specialists in the DWP network increased for endodontists (increased by 5, total of 12), periodontists (increased by 4, total of 10) and prosthodontists (increased by 1, total of 14) over the 2-year study period.
    - The number of DWP oral surgeons decreased by four, for a total of 55.
- During Year 2, there were 822 dentists in Iowa who submitted at least 1 claim to the DWP during the study period. Active dentists include those who have signed a contract to be in the DWP network and non-network dentists who may have seen a DWP patient with prior authorization from DDIA but have not signed a contract. These active dentists include 716 general dentists and 15 pediatric dentists, which are collectively considered primary care dentists.
    - During the same time period, there were 1080 active MSP dentists and 1552 active DDIA dentists.
    - Active dental specialists varied substantially between programs: in general DDIA had more active specialists, followed by DWP, and then MSP. For example, 46 endodontists provided services to DDIA members, 12 to DWP members, and 7 to MSP members.

1 McKernan S, Pooley M, Kuthy R. March 2015. Momany E, Damiano P. Iowa Dental Wellness Plan: Evaluation of Baseline Provider Network. University of Iowa Public Policy Center; Iowa City, IA. Available at: http://ppc.uiowa.edu/sites/default/files/dwp_provider_report.pdf. Last accessed March 28, 2017.

2 McKernan S, Pooley M, Ingleshwar A, Kuthy R, Momany E, Damiano P. March 2016. Evaluation of Provider Network in the Iowa Dental Wellness Plan during the First Year. University of Iowa Public Policy Center; Iowa City, IA. Available at: http://ppc.uiowa.edu/sites/default/files/dwp_provider_adequacy.pdf. Last accessed March 28, 2017.

- Out of state provider information was not available for DDIA, but an additional 62 dentists outside of Iowa were active DWP providers during Year 2 and 70 additional dentists were active MSP providers.
- County-level primary care dentist to population ratios were calculated as the number of general and pediatric dentists per 1000 program members. Dentist and member numbers were adjusted to full-time equivalents based on the number of counties that a dentist worked in and number of months that members were enrolled during the year.
    - During Year 2, there was a county mean of 6.8 active primary care dentists per 1000 DWP members, ranging from 0 dentists in 12 counties to 17.9 in Cedar County.
    - Mean county primary care dentists per 1000 MSP members was 11.6 and 4.3 per 1000 DDIA members. The large difference in these ratios is largely related to the size of the population denominator. For example, in Polk County during Year 2 there were 91,338 DDIA members compared to 18,385 MSP members.
    - There were 12 counties with no active DWP primary care dentists.
- 14 Federally Qualified Health Centers (FQHCs) in 3 states provided dental services to DWP members. There was substantial overlap with MSP and DDIA safety net providers. Additional non-FQHC health centers, academic institutions, and Indian Health Services clinics provided care to DWP members.

Distance Measures

- Since primary care dentists (e.g., general and pediatric dentists) are typically the initial point of contact for DWP members' entry into the tiered benefit structure, we examined average distances to the nearest primary care dentist and, for members who had a visit, network distance to the treating primary care dentist in each program.
- During Year 2, mean distance to the nearest active primary care dentist was 3.1 miles for DWP members, 2.4 miles for MSP members, and 2.8 miles for DDIA members.
    - 95% of DWP members lived within 15 miles of a primary care dentist. In comparison, 98% of MSP members and 99% of DDIA members lived within 15 miles of an active primary care dentist.
- Mean distance to the treating primary care dentist was 13.7 miles for DWP members, 16.2 miles for MSP members, and 10.7 miles for DDIA members.
    - One important limitation to making comparisons between these distance outcomes is that MSP and DDIA members in this study were far more likely to have had a primary care dental visit compared to DWP members. Approximately 24% of DWP members in our study population had a primary care dental visit, compared to 70% of MSP and 52% of DDIA members.

Network Overlap

Out of 1,600 unique providers in Iowa, 42% (n=665) were active providers in all 3 programs (DWP, MSP, and DDIA).

Impact of DWP network growth

Although there was a significant improvement in the number of dentists contracted to be part of the DWP network, the utilization rates for DWP members did not increase accordingly. Only 25% of DWP members had a dental visit of any kind in the second year of the program, as compared to 70% of MSP members, and 50% of DDIA members. There are many factors, in addition to dentist availability, that go into whether a person accesses care such as perceived need for care, knowledge and attitude toward dental care, and a person's overall health status. These analyses define active dentists as those who accepted at least one DWP patient.

Future analyses will evaluate "active participation" differently including: 1) defining "active participation" as having to take at least a certain number of patients (e.g., 10 or 25 patients) rather

than just one, and 2) using surveys with dentists to determine their level of acceptance of: a) all new DWP members, b) some new DWP or c) no new DWP members, which is not able to be captured in these analyses and could still be limiting access for members. The lower utilization rate could also be related to relatively new enrollment of many DWP members, who may not have an established dentist of record, while many of the MSP and DDIA members will have been covered longer and will have had a longer opportunity to seek care and establish a dentist of record.

Background

On January 1, 2014 Iowa implemented the Iowa Health and Wellness Plan (IHAWP), which expanded health coverage for low income Iowans. IHAWP replaced the previous IowaCare program, offering more covered services and a broader provider network; while reducing the number of Iowans covered. IowaCare provided coverage for Iowans not categorically eligible for Medicaid through any other program or waiver and with incomes not exceeding 200% FPL, while Medicaid provided coverage for a similar population but only up to 138% FPL. IowaCare did not provide coverage for dental care, except for emergencies with coverage limited to extractions at two locations in the state. An evaluation of the IowaCare program indicated that members had significant pent up demand for dental care and poor oral status.[3] This evaluation, in part, led to the establishment of the Dental Wellness Plan (DWP).

The DWP began offering dental benefits to members of the IHAWP program on May 1, 2014. This report evaluates provider network adequacy during the second year of DWP implementation – May 2015 through April 2016 – and makes comparisons with the Year 1 provider network.

From May 2014 through July 2016, Delta Dental of Iowa was the sole dental carrier for the DWP. As of July 2016, MCNA Dental became the second carrier to join the DWP. Both dental carriers are required to offer the same benefits, however, each carrier maintains a separate network of dental providers. Since MCNA was not an active provider network during Year 2, it is excluded from this current evaluation.

Earned Benefit Structure

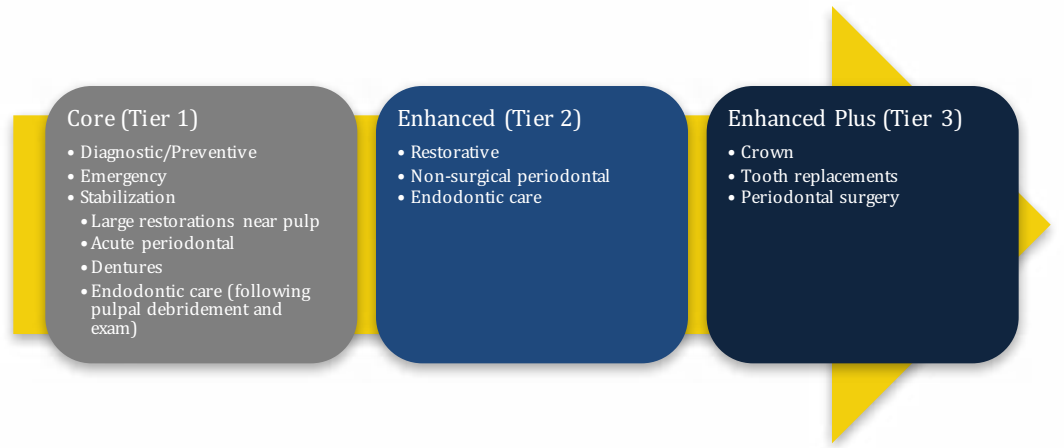
The DWP has a unique earned benefits structure to encourage preventive health care-seeking behaviors mirroring the healthy behavior incentive program found in the IHAWP. Members qualify for additional covered services when they return for regular and periodic routine oral evaluations. All members are eligible for Core benefits (Tier 1) upon enrollment, which includes emergency and stabilization services. If members return for a routine oral evaluation within 6-12 months of an initial comprehensive exam, they become eligible for Enhanced services (Tier 2). After receiving a second routine oral evaluation within 6-12 months of the first routine oral exam, members become eligible for Enhanced Plus services (Tier 3). Figure 1 shows dental services covered in each tier.

Provider Incentives

The DWP also includes provider incentives. First, provider reimbursement is approximately 50% higher than Medicaid. Second, there are bonuses for participating DWP dentists that reward general dentists based on the number of exams performed on members and reward specialists based on the number of unique members seen. General dentists are only eligible for this bonus if they complete an annual clinical risk assessment and accompanying online form for each new patient; providers are also reimbursed on a fee-for-service basis for conducting each risk assessment.

3 Damiano P, Bentler S, Momany E. Evaluation of the IowaCare Program: Information about the Medical Home Expansion. June 2013. UI Public Policy Center. Available at: http://ir.uiowa.edu/cgi/viewcontent.cgi?article=1080&context=ppc_health. Last accessed December 29, 2016.

Figure 1. Earned benefits through Iowa DWP



Healthy Behaviors Program

Originally, there were no charges to IHAWP members. Beginning in 2015, a monthly contribution began to be required, depending on family income. There are no copayments for health care services or prescriptions. As part of this new Healthy Behaviors Program, there are no charges to IHAWP members during the first year of enrollment. Beginning in the second year, members contribute up to $10 per month. Contributions are waived for individuals who fulfill two Healthy Behavior requirements: complete a Health Risk Assessment (available online, by phone, or at some provider offices) and receive either a preventive exam conducted by a physician or a routine oral evaluation from a dental provider.[4]

4 Iowa Department of Human Services. April 2015. Iowa Health and Wellness Plan Healthy Behaviors Program Toolkit for Providers. April 2015. https://dhs.iowa.gov/sites/default/files/ProviderHealthyBehaviorsToolkit_April2015.pdf. Last accessed: December 29, 2016.

Research Methods

This report evaluates provider network adequacy during the second year of the DWP, May 2015 through April 2016 ("Year 2"). We also make comparisons with Year 1 (May 2014 – April 2015) outcomes, where appropriate, to highlight changes over time.

The DWP was expected to offer members a larger provider network than the network that is available to the adult traditional Medicaid population. Increased dentist participation in DWP was hypothesized to occur due to higher reimbursement rates and reduced administrative burdens. In order to compare provider networks, we assess two major components:

- Dentist supply measures (e.g., dentist to population ratios)
- Distance measures (e.g., distance to the nearest dentist)

These two components reflect spatial accessibility, or potential physical accessibility, to dental care. [5] This report addresses **Hypothesis 5.1** of the Public Policy Center's DWP evaluation plan:

> "DWP Members will have better access to an adequate provider network than those in the Medicaid State Plan as reflected by travel distance and time, access to safety net providers, and provider acceptance of new patients."

Two measures are specified with this hypothesis:

Measure 28: Travel distance and travel time to regular dentist

Measure 29: Provider network inclusion of safety net dental providers, particularly FQHCs

In addition to these measures, network adequacy has been indirectly evaluated through additional components of the DWP evaluation: 1) consumer surveys assess members' perspectives about access to dental care, including transportation issues, and 2) dentist surveys include questions about the extent to which dentists accept DWP patients into their practices.

Study Populations

In this report, we examine network adequacy for the DWP population during Program Year 2 and include two comparison groups: traditional adult MSP members and Delta Dental of Iowa (DDIA) commercial enrollees. All three study groups were limited to members with a valid address on file.

Dental Wellness Plan (DWP)

DWP provides dental coverage for all low income members enrolled in IHAWP. This population includes adults aged 19 to 64 with income between 0 and 133% of the Federal Poverty Level (FPL) who are not otherwise eligible for Medicaid or Medicare. Dental benefits in DWP are provided by a network of dentists recruited specifically for this program. DWP dental benefit structures are the same for all IHAWP members, irrespective of their type of plan.

Medicaid State Plan (MSP)

The first comparison group includes all adult (19-64 years) non-institutionalized Medicaid enrollees with at least 1 month of enrollment during Year 2. The non-institutionalized adult Medicaid population includes members eligible through income or disability determination. Specifically, members in the following MSP programs were included in this comparison group: income eligibles, Supplemental Security Income (SSI) beneficiaries, foster, and Medicaid for Employed People with Disabilities (MEPD). These MSP categories in Iowa include dental coverage for members. Dental care for Medicaid enrollees is provided through a fee-for-service state run program. The benefits and payment structures for the provision of dental care are the same for all MSP members in this comparison group.

It is hypothesized that adult MSP members will have less access to a dental provider network, measured in terms of: 1) number of local participating dentists, and 2) distance to the nearest dentist.

5 Guagliardo MF (2004). Spatial accessibility of primary care: concepts, methods and challenges. International Journal of Health Geographics. 3(3):1-13.

Delta Dental of Iowa (DDIA) Commercial Plans

The second comparison group includes all adults (19-64 years) residing in the state of Iowa with commercial dental coverage through Delta Dental of Iowa (DDIA). Claims and enrollment data from DDIA commercial plans are used as a second comparison group. One limitation with using this comparison group is that DDIA commercial insurance products vary in coverage and provider network availability. In general, DDIA offers two broad plans: Plus or Prime, which differ primarily in their coverage of the ACA pediatric dental essential health benefit.[6] Within those two plans, there are three major levels of coverage, which vary in annual benefit maximums and services covered. At the higher end of coverage, the "Platinum" plan covers preventive, restorative, and major services, with a $2000 annual maximum. The most basic "Preventive" plan covers preventive services and cavity repair with no annual maximum for these routine services.

Deductibles and co-insurance within these DDIA commercial products vary further based on where the member receives services. DDIA maintains two provider networks: Delta Dental Premier and Delta Dental PPO. Delta Dental Premier includes over 90% of dentists in Iowa, whose contracts prohibit billing over pre-negotiated rates. Dentists who participate in the PPO network are reimbursed at lower negotiated rates. Approximately 30% of dentists in Iowa participate in the PPO network. Member Deductibles and co-insurance varies depending on whether the treating provider is in the Premier or PPO network, or whether the dentist is out of network.

It is hypothesized that DDIA members will have greater access to a provider network, measured in terms of number of local participating dentists and distance to the nearest dentist.

Provider Inclusion Criteria

DWP Providers

DWP network providers are defined by DDIA, which administers the DWP program. A list of DWP participating providers from DDIA identified monthly status of individual dentists throughout Year 2. Participating providers include all dentists who have a current contract with DDIA. Participating providers are further distinguished based on whether or not they currently accept new DWP patients into their practices; per DDIA, this information is voluntarily self-reported.

Active DWP providers are defined for this report based on claim activity and include all dentists who were paid for any services to DDIA on behalf of at least one DWP member during Year 2.

Medicaid (MSP) Providers

MSP network providers are defined as any dentist that has signed an agreement with Iowa Medicaid to be a participating dentist. As of July 2016, the Medicaid provider dataset included 3,417 unique dentists in Iowa. However, in 2015, there were only 1,414 dentists licensed in the state, indicating limited validity of the state's Medicaid provider list.[7]

Active MSP providers are determined based on claims activity since the Medicaid provider dataset does not regularly purge inactive providers. Therefore, in this report we identify dentists as active MSP providers if they submitted at least one claim at dentists who have recently treated an adult MSP member represent the available provider network. We excluded dentists who may have only treated children, since a recent study found that many dentists in Iowa limit their Medicaid participation to just children.[8] In 2013, 28% of dentists who reported accepting Medicaid patients indicated that they limit this acceptance to children.

DDIA Providers

DDIA network providers are defined as dentists who are contracted with Delta Dental through either their Delta Dental PPO network or their Premier network.

6 Delta Dental of Iowa. Plan Options. Available at: https://www.deltadentalia.net/plan-options. Accessed February 15, 2017.

7 Office of Statewide Clinical Education Programs. 2016 Iowa Dentist Tracking System Annual Report. University of Iowa Carver College of Medicine; Iowa City, IA. Available at: https://medicine.uiowa.edu/oscep/data-and-reports. Accessed 2/15/17.

8 McKernan SC, et al. Factors affecting Iowa dentist participation in Medicaid. December 2013. University of Iowa Public Policy Center; Iowa City, IA. Available at: http://ppc.uiowa.edu/sites/default/files/evaluation_of_medicaid_final.pdf. Accessed 2/15/17.

Active DDIA Providers are determined based on claims activity. Dentists are identified as active DDIA providers if they submitted at least one claim to a member of the DDIA commercially insured study population.

Dentist Supply Calculations

Individual dentists are identified by National Provider Identifier (NPI) in the DWP and MSP datasets and by license number in the DDIA commercial dataset. Practice locations are identified based on unique street address and city. Dentist supply measures at the state and program levels represent counts of unique dentists.

Dentist-to-population Ratios

County supply measures of primary care dentists, which include general and pediatric dentists, are expressed as full time equivalent (FTE) dentist-to-population ratios and calculated as the number of primary care dentists per 1,000 FTE members. Measures are adjusted to account for dentists with multiple practice locations, which are frequently located in multiple counties. For example, providers were listed in as many as 14 practice locations in our data. This phenomenon appears to be largely driven by corporate dental practices that list all of their dentists at each location. Due to the lack of information about how individual dentists split time between multiple practices, we assumed that dentists worked equivalently at each practice location. For example, a dentist with two practice locations is assumed to work 50%, or 0.5 FTE, at each site. This adjustment prevents overestimation of workforce supply, the effects of which would be more pronounced in areas with fewer dentists.

Geocoding

Provider and member addresses are geocoded to the street address level. Address data were cleaned prior to geocoding. Members with addresses that could not be geocoded to street address level were excluded from analysis. Providers with addresses out of Iowa were included in this evaluation; however, members with out of state addresses were omitted.

Geocoding was carried out in multiple steps. Locations were initially geocoded using an address locator created in ESRI ArcMap 10.3 using the "North American Detailed Streets" dataset maintained by ESRI. Addresses incorrectly located or not located after this process were located using a combination of Google Maps geocoding API and Open Street Map geocoding API. The Google Maps API is fast and accurate, but has 24 hour period query limits. When limits were reached, the Open Street Map API was employed to geocode the remaining locations. Sample sizes noted throughout the report may vary due to loss in the process of geocoding members' addresses.

Distance Calculations

Distance to the nearest primary care dentist (i.e. general or pediatric dentist) measures potential access to care, whereas distance to the treating primary care dentist measures realized access.

Nearest Primary Care Dentist

For all members of each program, we calculated distance to the nearest active primary care dentist in the provider network. Networks were limited to Iowa providers only since out of state network information was not available for DDIA.

Treating Primary Care Dentist

In addition to calculating distance to the nearest dentist for all members, we also calculated distance to the treating provider for members who saw a primary care dentist (i.e. general or pediatric dentist) at least once during Year 2. Distance calculations were limited to active dentists in Iowa during Year 2. For members who saw more than one primary care dentist during the study period, we calculated distance to the dentist with the most visits. Instances of ties were resolved at random.

Public Safety Net Providers

For this evaluation, we defined public safety net sites to include Federally Qualified Health Centers (FQHCs), non-FQHC Community Health Centers, academic institutions, Indian Health Service clinics, and other non-profit clinics.

Provider Panel Overlap

Individual dentists were identified by NPI and license number across programs. Overlap was reviewed among active providers.

Data Analysis

Univariate and bivariate statistics were calculated using IBM SPSS Statistics 24. Network analysis and maps were generated using ESRI ArcMap 10.4.

Member Enrollment and Demographic Characteristics

The study population for this report is limited to members with at least one month of enrollment during the study period and a valid street address on file. Valid addresses are required for the distance calculations. A major source of invalid addresses is P.O. Boxes, since we are unable to identify where a member lives in relation to the post office. Distance between the post office and residence may be greater in rural areas than in urban areas and we did not want to introduce bias in our assessment of travel distances to nearest or treating providers. Thus, these addresses were excluded, along with missing or incomplete street addresses.

Approximately 3-11% of members in each program did not have a valid address for Year 2; rates of valid addresses were highest for DWP (96%) and lowest for MSP (89%) (Appendix A, Table A1). This resulted in 161,353 members enrolled in DWP for at least one month with a valid address being included in this study (Table 1). The MSP population was slightly smaller (N=114,437), while the DDIA adult population was substantially larger (N=451,950).

Table 1. Unique members by program and year, 2014-2016

	Year 1	Year 2
	May 2014 – April 2015	*May 2015 – April 2016*
DWP	128,540	161,353
MSP	169,811	114,327
DDIA	480,548	451,950

Table 2 shows demographic characteristics for the DWP, MSP, and DDIA Year 2 comparison groups. Proportionally there were more females enrolled in MSP (67%) compared to DWP (54%) and DDIA (52%). Racial and ethnic composition of the DWP and MSP populations were found to be similar; this information is not available for the DDIA population.

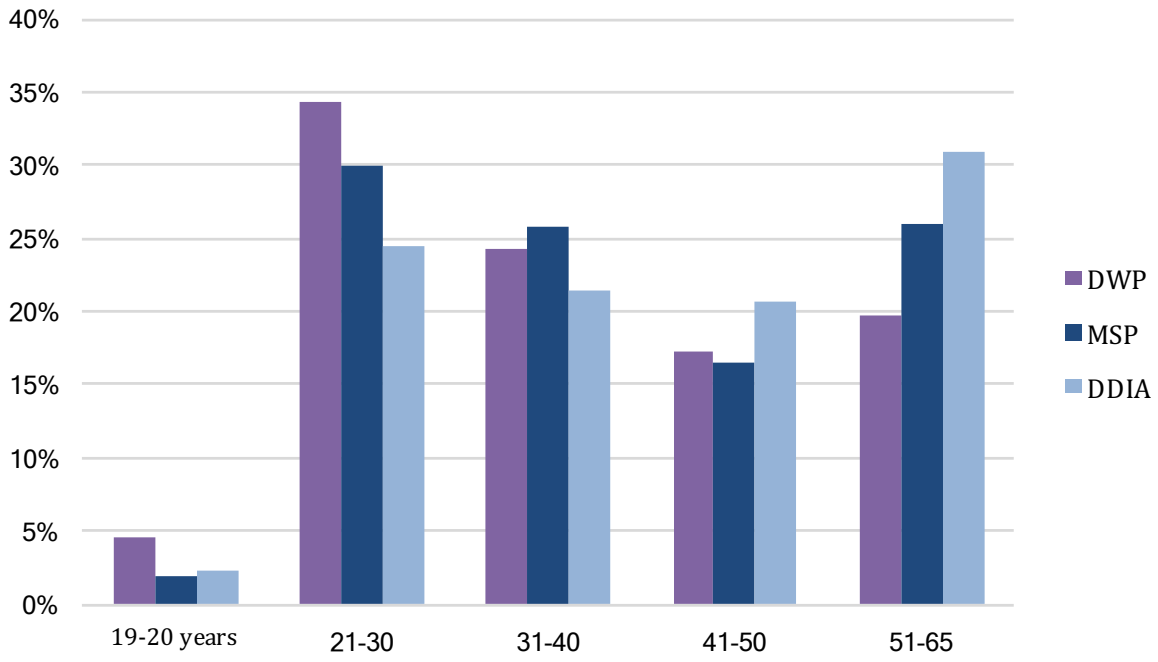
Age distribution of members by program during Year 2 is displayed in Figure 2. Mean age of the DWP population was slightly lower at 37 years, compared to 40 in the MSP population and 41.5 in the DDIA population. Fewer than 20% of DWP members were over the age of 50, compared to 26% of MSP members and 31% of DDIA members.

Table 2. Demographic characteristics of members by program, Year 2 (2015-2016)

	DWP	MSP	DDIA
	Number (%)	Number (%)	Number (%)
Sex*			
Female	86,836 (53.8%)	76,159 (66.6%)	237,025 (52.4%)
Male	74517 (46.2)	38,168 (33.4)	208,677 (46.2)
Race			
White	107,004 (63.8)	71,319 (62.4)	
Black	14,677 (8.7)	10,875 (9.5)	
American Indian	2,153 (1.3)	1,356 (1.2)	
Asian	4,357 (2.6)	1,841 (1.6)	
Hispanic	7,787 (4.6)	4,136 (3.6)	
Pacific Islander	1,108 (.7)	535 (.5)	
Multiple-Hispanic	2,185 (1.3)	1,334 (1.2)	
Multiple-Other	1,674 (1.0)	814 (.7)	
Undeclared	26,804 (16.0)	22,117 (19.3)	
Age			
19-20 years	7,186 (4.5)	2,130 (1.9)	10,244 (2.3)
21-30	55,573 (34.4)	34,256 (30.0)	110,922 (24.5)
31-40	38,995 (24.2)	29,420 (25.7)	96,805 (21.4)
41-50	27,683 (17.2)	18,884 (16.5)	93,745 (20.7)
51-65	31,916 (19.8)	29,637 (25.9)	140,234 (31.0)
County Urbanicity			
Metropolitan	99,702 (61.8)	67,702 (59.2)	287,087 (63.5)
Non-metropolitan	61,651 (38.2)	46,625 (40.8)	164,863 (36.5)
Total	**161,353**	**114,327**	**451,950**

*Counts for DDIA may not add up to total due to missing information on sex

Figure 2. Age distribution of members by program, Year 2



Changes in Population Demographics, Year 1 to Year 2

In Year 1, the DWP population was more likely to be male and older than adults in the MSP comparison group. The DWP population in Year 2 is somewhat younger than the MSP comparison group; during Year 1, 27.2% of DWP members were over age 51, compared to 19.8% in Year 2. Age distribution in the DDIA commercial adult population was relatively stable and older than either the DWP or MSP comparison groups, with 30.7% (Year 1) and 31.0% (Year 2) of adult members over age 51 (Year 1 descriptive statistics for DDIA are provided in Appendix B). Racial/ethnic distribution of the DWP and MSP study populations were similar during Year 2 and relatively unchanged from Year 1. Racial/ethnic data were not available from DDIA for their commercially insured population.

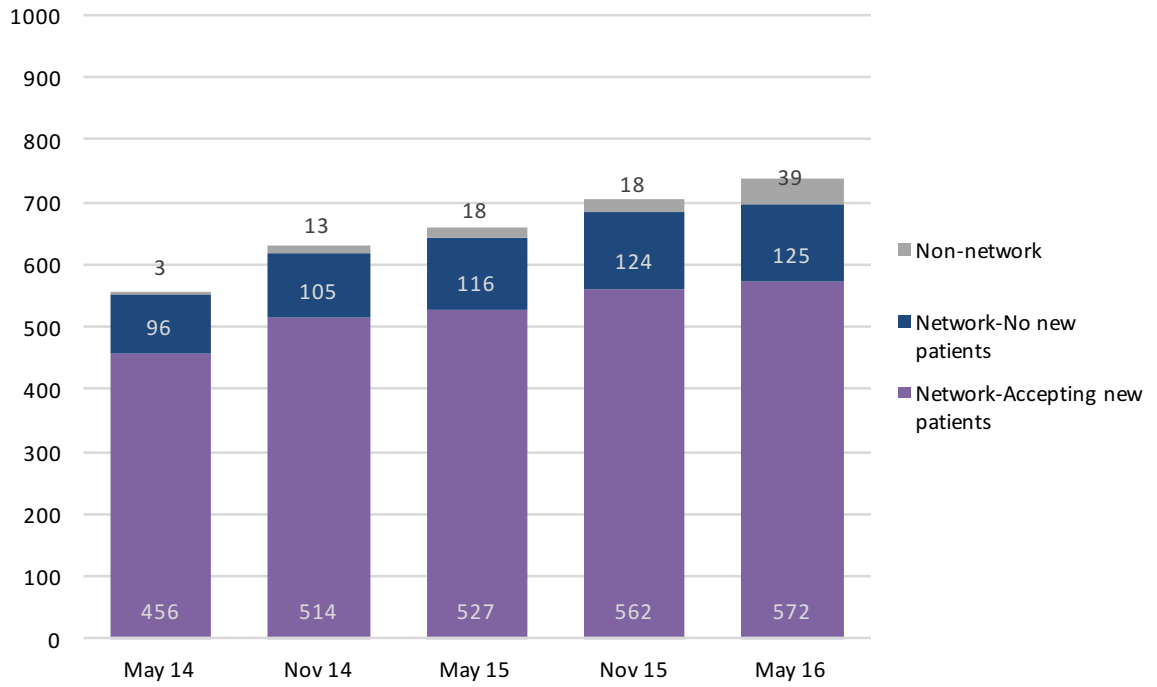
Dentist Supply

DWP Provider Network

The official DWP provider network, as included in the DWP provider database, includes contracted network providers and some non-network providers who have receive ad hoc authorization to provide one time services to DWP members. Network providers may voluntarily self-report to Delta Dental of Iowa that they are not currently accepting new DWP patients.

The DWP provider network of primary care dentists, including general and pediatric dentists, is shown in Figure 3. The number of contracted network dentists increased from 552 in May 2014 to 697 as of May 2016. The proportion of network dentists reporting that they are not accepting new patients has remained relatively stable, with approximately 17-18% of primary care dentists self-reporting this to DDIA.

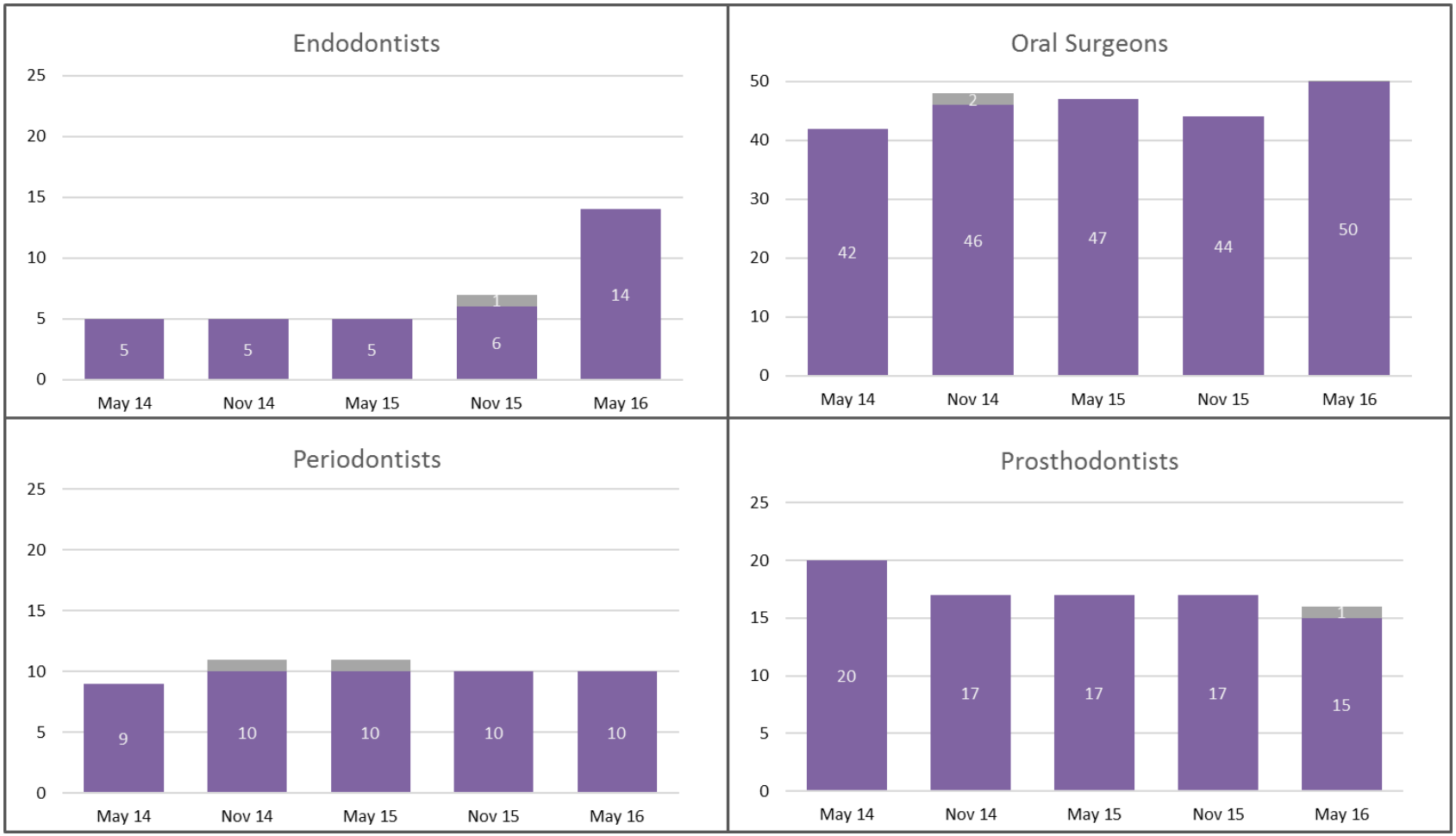
Figure 3. DWP primary care dentist network*, May 2014 – May 2016



*Note: Categories are based on self-report by the dentist to DDIA, not on their actual behavior. For example, some dentists may not be accepting new DWP patients but have not reported this to DDIA.

The DWP provider network of dental specialists is shown in Figure 4. As of May 2016, there were 14 endodontists, 50 oral surgeons, 10 periodontists, and 15 prosthodontists in the DWP network. This includes dentists located in any state. The next section examines the number of active dentists in each program – that is, dentists who submitted at least one claim to each program during the study period.

Figure 4. DWP dental specialty network, May 2014 – May 2016



Active Dentist Supply

Because the network provider files described in the previous section offer limited information about program participation, we used claims data to determine the dentists who were actually "active" in DWP for this study. "Active" is defined as all dentists who submitted at least one claim on behalf of program members during Year 2 (i.e., May 2015 – April 2016). Active dentists include both those who have signed a contract to be in the DWP network and non-network dentists who may have seen a DWP member with a prior authorization from DDIA but have not signed a contract. As a result, there are more active dentists than the number that appear on the DWP network registry described in the previous section.

Table 3 provides information about active dentists in Iowa by specialty; out of state dentists are reported separately since our data for the DDIA provider network do not include out of state dentists. Additionally, we have excluded orthodontists from these counts since orthodontic benefits are not covered by the DWP.

Table 3. Active dentists in Iowa by specialty, Year 2

	DWP	MSP	DDIA
	N (%)	N (%)	N (%)
General Dentists	716 (87.1%)	955 (89.3%)	1317 (84.9%)
Endodontists	12 (1.5)	7 (0.7)	46 (3.0)
Oral Surgeons	55 (6.7)	61 (5.7)	76 (4.9)
Pediatric Dentists	15 (1.8)	20 (1.9)	53 (3.4)
Periodontists	10 (1.2)	8 (0.7)	27 (1.7)
Prosthodontists	14 (1.7)	18 (1.7)	33 (2.1)
Total	822 (100)	1069 (100)	1552 (100)

During Year 2, 822 dentists in Iowa were active DWP providers (Table 3); 89% of these providers were primary care dentists (n=731), which include general and pediatric dentists. An additional 62 unique dentists were active in the out of state DWP network (Table 4), resulting in a total of 884 unique active DWP providers during Year 2. Out of state DWP providers were most commonly located in Illinois (n=23), Nebraska (n=23), and South Dakota (n=5).

During the same period, 1,069 dentists in Iowa were active MSP providers for the adult MSP population; 91% of these were primary care dentists (n=975) (Table 3). An additional 70 unique dentists were active providers in the out of state network (Table 4), resulting in a total of 1,150 active dentists in the MSP network during Year 2. Out of state MSP providers were most commonly located in Nebraska (n=29), Illinois (n=20), and Wisconsin (n=5).

Overall, 1,552 dentists in Iowa provided services to the adult DDIA population during Year 2; 88% of these were primary care dentists (n=1,370). Overall, proportionally more active dentists in the DDIA network were specialists, compared to higher proportions of primary care dentists in DWP and MSP.

Table 4. Active dentists out of state by specialty, Year 2

	DWP	MSP	DDIA*
	N (%)	N (%)	N (%)
General Dentists	57 (91.9%)	61 (87.1%)	
Endodontists	0	0	
Oral Surgeons	5 (8.1)	7 (10.0)	
Pediatric Dentists	0	1 (1.4)	
Periodontists	0	1 (1.4)	
Prosthodontists	0	0	
Total	62 (100)	70 (100)	

*Out of state provider data not available for DDIA.

Changes in Active Dentist Supply, Year 1 to Year 2

Since primary care dentists (e.g., general and pediatric dentists) are typically the initial point of contact for DWP members' entry into the tiered benefit structure, we have examined trends in the availability of primary care dentists in each network. These trends are displayed graphically in Figure 5. Note that these figures are limited to active dentists located in Iowa and include dentists in all practice settings (i.e., private practice or safety net locations). Overall, the number of active primary care dentists in Iowa, including general and pediatric dentists, who provided care to at least one DWP member increased from Year 1 to Year 2 by 75 providers. The corresponding number of active primary care dentists who provided care to adult MSP members decreased by 150; active DDIA primary care dentists decreased slightly from 1,381 (Table A2) to 1,370.

Changes in the number of active dental specialists are shown in Figure 6. Numbers of active DWP increased slightly, except for oral surgeons, which decreased from 59 to 55.

Geographical Distribution of Active Dentists

Figures 7 and 8 show locations of active dentists, by specialty and by program, with comparisons between Year 1 and 2. Counties are distinguished as metropolitan versus non-metropolitan; dentist locations are indicated at city level. Maps do not indicate relative number of each specialist, only locations where these providers can be found.

Figure 5. Changes in active primary care dentists in Iowa, Year 1 to Year 2

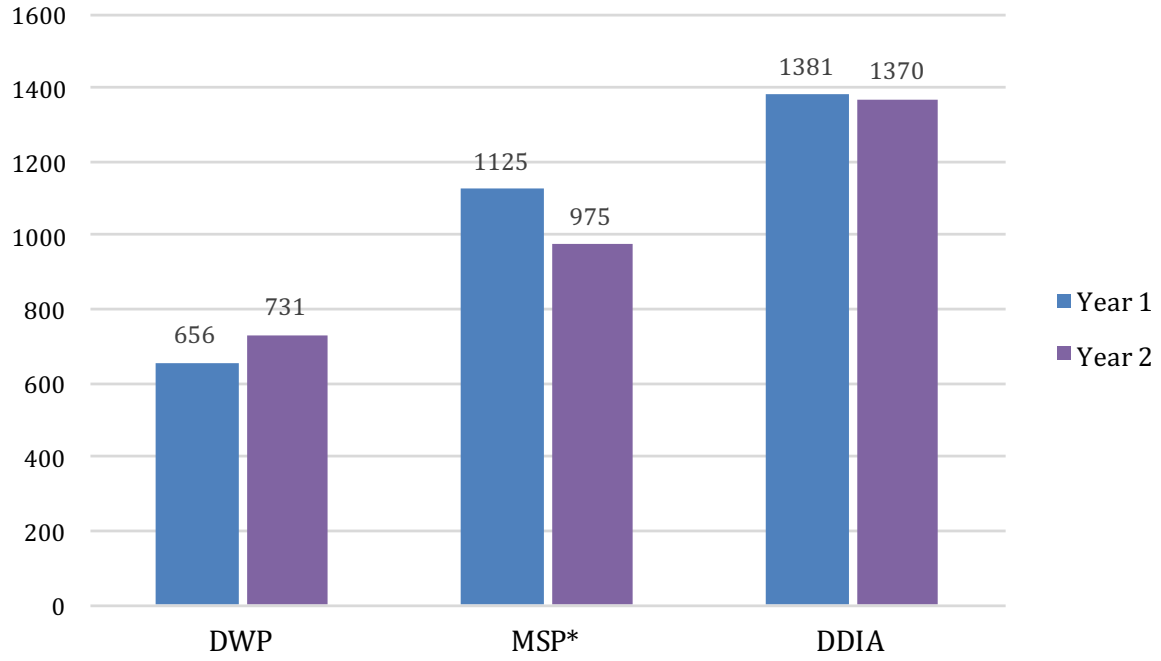


Figure 6. Changes in active dental specialists, Year 1 to Year 2

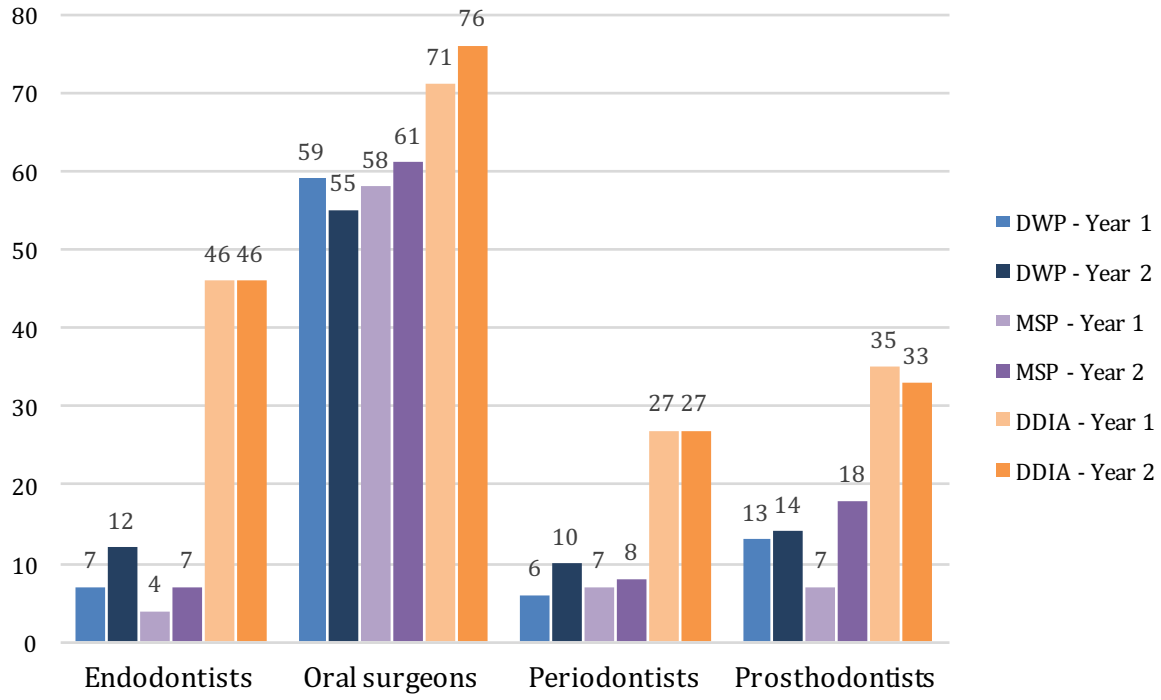
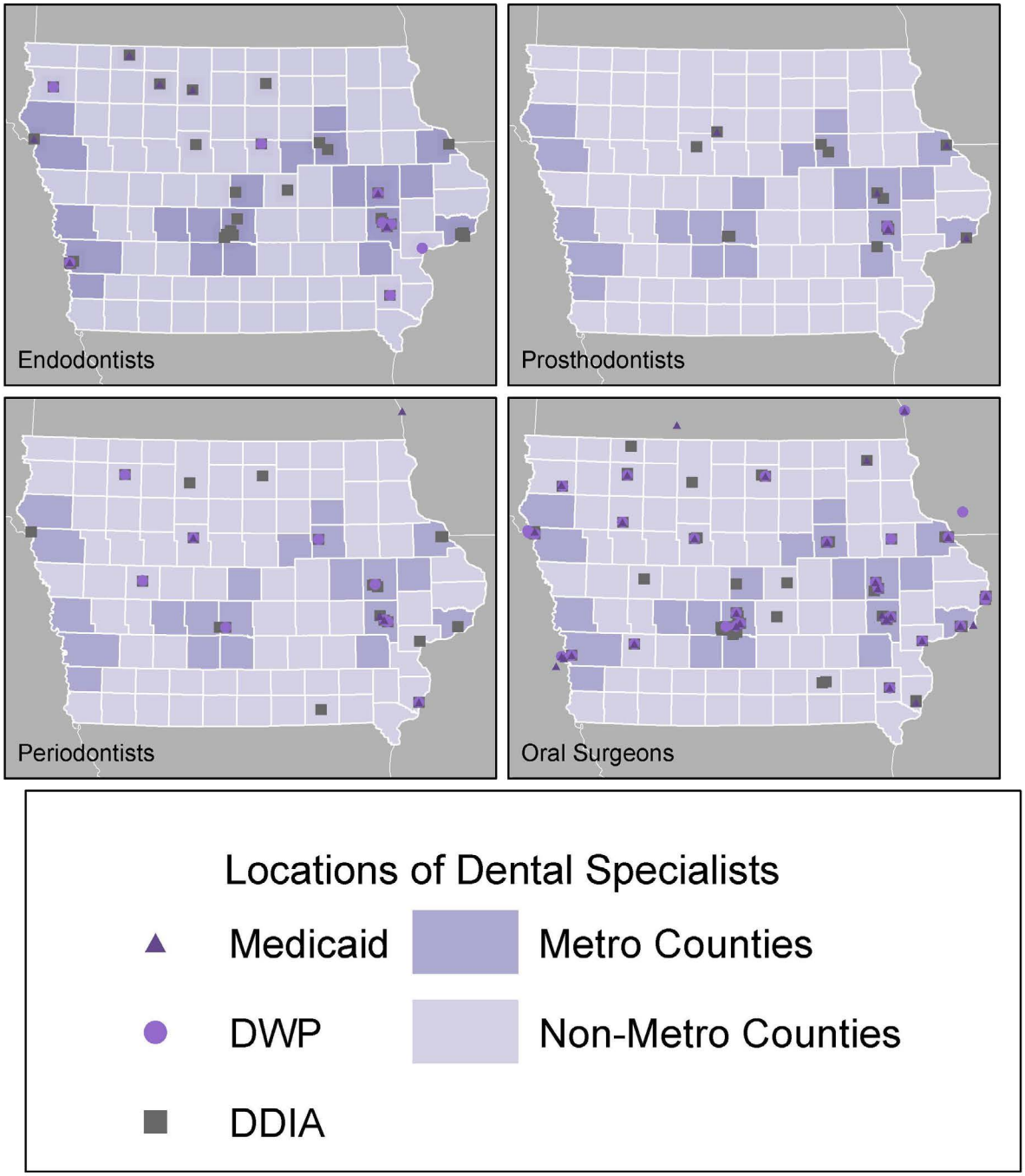


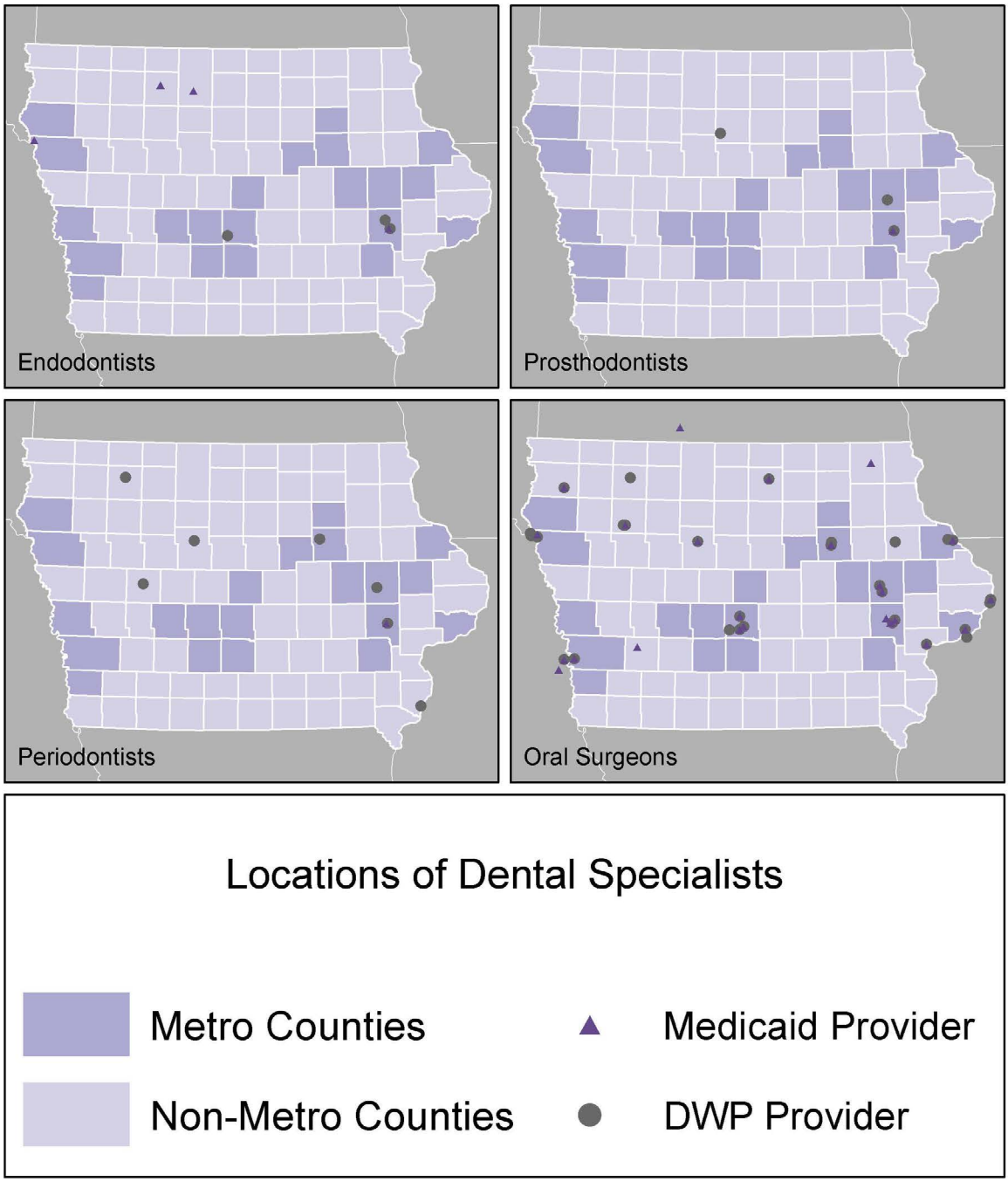
Figure 7. Locations of active dental specialists by county and program, Year 2



Data Sources:
County 2013 RUCC codes obtained from USDA Economic Research Service

March 2017

Figure 8. Locations of active dental specialists by county and program, Year 1



Data Sources:
County 2013 RUCC codes obtained from USDA Economic Research Service

March 2016

County Level Supply of Active Primary Care Dentists

Full-time equivalents (FTEs) for active primary care dentists (Table 5) were calculated based on the proportion of each dentist's clinic address per county. For example, if a dentist had 2 practice locations, each located in a different county, they were assigned 0.5 FTE per county. Summary statistics are located in Tables 5 and 6; county-specific numbers are provided in Appendix C.

In Year 2, average number of active DWP primary care dentists (FTEs) per county was 7.8 and ranged from 0 to 106.6 (Table 5). There were no active DWP primary care dentists in 12 counties: Allamakee,

Chickasaw, Clarke, Greene, Howard, Humboldt, Monona, Monroe, Osceola, Ringgold, Van Buren, and Worth County. Total unique members in these counties ranged from 189 (Osceola County) to 545 (Clarke County) during the same time period. The highest number of DWP primary care FTEs were located in Polk County (n=106.6), Johnson County (n=60.8), and Linn County (n=54.5).

In comparison, the average number of FTE primary care dentists per county in the Medicaid network was 10.0 and ranged from 0 in 2 counties (Osceola and Ringgold) to 133.9 (Polk County). Average number of FTE primary care dentists in the DDIA commercial network was 16.5 and ranged from 0 (Ringgold County) to 279.4 (Polk County).

Table 5. County primary care dentist FTEs*, Year 2 (N=99)

	DWP	MSP	DDIA
Mean	7.8	10.0	16.5
Median	3.5	4.0	6.5
Std. Dev.	14.7	19.2	37.3
Range	0 – 106.6	0 – 133.9	0 – 279.4
Percentiles			
25	1.8	2.5	3.0
50	3.5	4.0	6.5
75	6.2	8.0	10.1
Sum	731.0	993.0	1629.0

*Primary care dentists include general and pediatric dentists; FTEs are calculated based on number of counties that a dentist practices in.

Dentist to population ratios (Table 6) adjust county dentist supply by the number of members in each program; this offers information about workforce supply relative to an estimation of demand. Dentist ratios were calculated as the number of FTE primary care dentists per 1000 FTE program members. Member FTEs were based proportionally on the number of months enrolled during Year 2. For example, a member enrolled for 12 months during Year 2 contributed 1.0 FTE to the denominator.

A sensitivity analysis comparing dentist ratios calculated using MSP FTEs versus headcounts of unique members and dentists per county is found in Appendix A, Table A2. Overall, adjusting for FTEs of dentists and members resulted in higher dentist to population ratios for the majority of counties (N=74), due primarily to the decrease in the population denominator after adjusting for length of enrollment.

During Year 2, the average DWP county dentist to population ratio was 6.8 FTE primary care providers per 1000 FTE members (Table 6). Dentist ratios for the DWP network ranged from 0 in 12 counties – corresponding to the counties listed previously – to 17.9 dentists per 1000 members in Cedar County. Polk County had a DWP dentist to population ratio of 5.0 dentists per 10000 members.

Table 6. County primary care dentist to population ratios*, Year 2 (N=99)

	DWP	MSP	DDIA
Mean	6.8	11.6	4.3
Median	6.6	10.0	3.7
Std. Dev.	4.3	6.3	2.2
Range	0 – 17.9	0 – 32.5	0 – 11.0
Percentiles			
25	3.9	7.1	2.7
50	6.6	10.0	3.7
75	9.5	15.7	5.8

* FTE dentists per 1000 FTE program members; member FTEs are based on number of months enrolled during the 12-month study period.

By comparison, the average dentist to population ratio for the MSP population during Year 2 was 11.6 per 1000 adult members, with a maximum of 32.5 dentists per 1000 members in Johnson County. DDIA dentist to population ratios ranged from 0 to 11.0 in Pottawattamie County, with an average of 4.3 dentists per 1000 adult members enrolled in commercial plans.

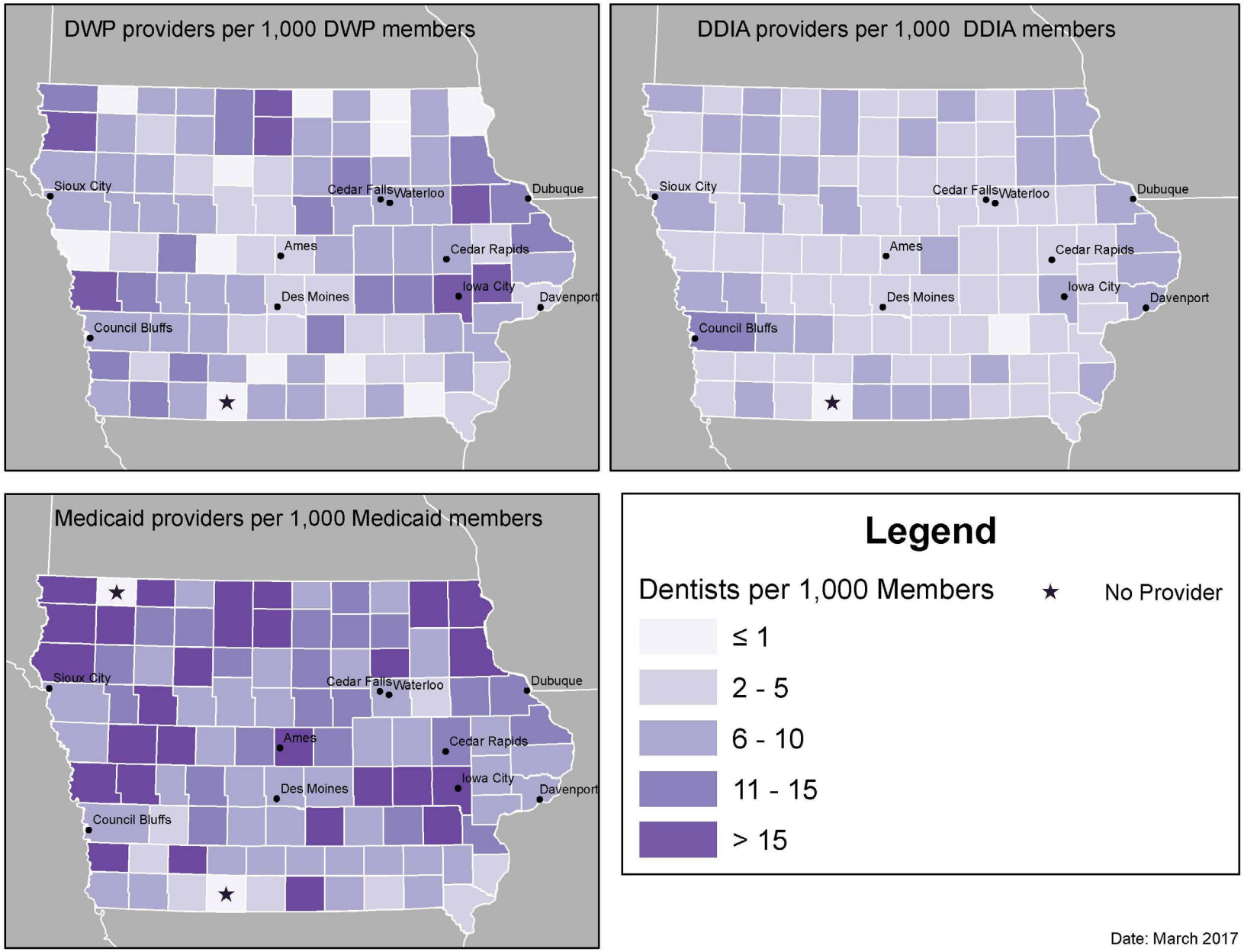
Primary care dentist ratios are listed by county in Appendix C and mapped in Figure 9. The lower numbers for the DDIA county dentist ratios partially reflect the much larger number of members per county when compared to DWP or MSP. For example, in Polk County during the study period, there were 91,338 unique members (with a valid address) enrolled in DDIA, compared to 31,651 in DWP and 18,385 in MSP. Correspondingly, higher dentist ratios in the MSP population are partially a function of lower numbers of members per county (median=432) compared to DWP (median=627) and DDIA (median=1703).

Changes in County Dentist Ratios, Year 1 to Year 2

In Year 1, primary care dentist ratios were comparable between DWP and Medicaid (9.3 vs. 9.1 dentists per 1000 members, respectively). However, mean and median county dentist ratios for DWP are lower in Year 2 than they are for the MSP population.

Since the overall number of dentists who were active DWP providers increased from Year 1 to Year 2, the decline in dentist ratios is attributable to either shifts in: a) the geographic distribution of members or b) the distribution of active dentists at the county level. We will explore these trends in our final evaluation.

Figure 9. Active primary care dentist to population ratios by county, Year 2



Distance to Nearest Active Primary Care Dentist

During Year 2, mean distance to the nearest active primary care dentist (i.e. general or pediatric dentist) was 3.1 miles for DWP members, 2.4 miles for MSP members, and 2.8 miles for DDIA members (Table 7).

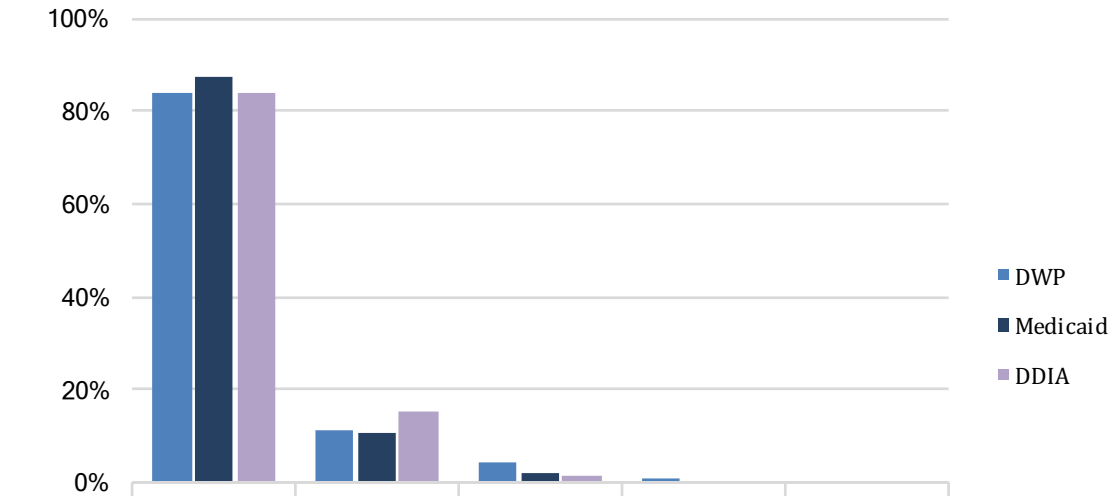
Table 7. Distance to the nearest active primary care dentist by program, Year 2

	DWP N=161,102*		MSP N=114,327		DDIA N=491,950	
	Distance (miles)	Time (minutes)	Distance (miles)	Time (minutes)	Distance (miles)	Time (minutes)
Mean (SD)	3.1 miles (5.2)	5.1 min (7.8)	2.4 miles (4.0)	4.0 min (6.1)	2.8 miles (3.9)	4.8 min
Median	1.0	2.0	.88	1.7	.98	6.1
Range	0 – 45.9	0 – 70.2	0 – 28.50	0 – 44.4	0 – 27.5	0 – 46.2

*DWP study population in Table 7 is slightly smaller than reported in Table 2 (n=161,353) due to losses during network analysis.

Previous network analysis revealed that travel distance and time correspond well in these populations due to the regular road network availability and lack of impeding geography.[9] Therefore, in this report we have included figures displaying distribution of members by travel distance only (Figures 10 and 11). In Year 2, 84% of DWP members lived within 5 miles of the nearest active primary care dentist (i.e. general or pediatric dentist), compared to 87% of MSP members and 84% of DDIA member (Figure 10). Nearly all members of the 3 plans lived within 25 miles of the nearest primary care dentist.

Figure 10. Distribution of members by travel distance (miles) to the nearest primary care dentist, Year 2



	0-5 miles	6-15 miles	16-25 miles	26-35 miles	>35 miles
DWP	84.1%	11.2%	4.2%	0.5%	0.0%
Medicaid	87.4%	10.6%	1.9%	0.0%	
DDIA	83.6%	15.1%	1.3%	0.0%	

9 McKernan SC, et al. Evaluation of provider network in the Iowa Dental Wellness Plan during the first year. A policy brief. March 2016. University of Iowa Public Policy Center. Iowa City, IA. Available at: http://ppc.uiowa.edu/publications/evaluation-provider-network-iowa-dental-wellness-plan-during-first-year. Accessed: March 20, 2017. *See Figures 11 and 12 (page 22).*

Distance to Treating Primary Care Dentist

The following analyses evaluate the actual behavior of those members who did have a primary care dental visit during year 2 as compared to the potential access to a dentist in the previous analyses. DWP members who saw a primary care dentist traveled a mean distance of 13.7 miles, corresponding to mean travel time of approximately 18 minutes (Table 8). In comparison, MSP adult members traveled approximately 16 miles (21 minutes) to see a primary care dentist and DDIA members traveled approximately 11 miles (15 minutes).

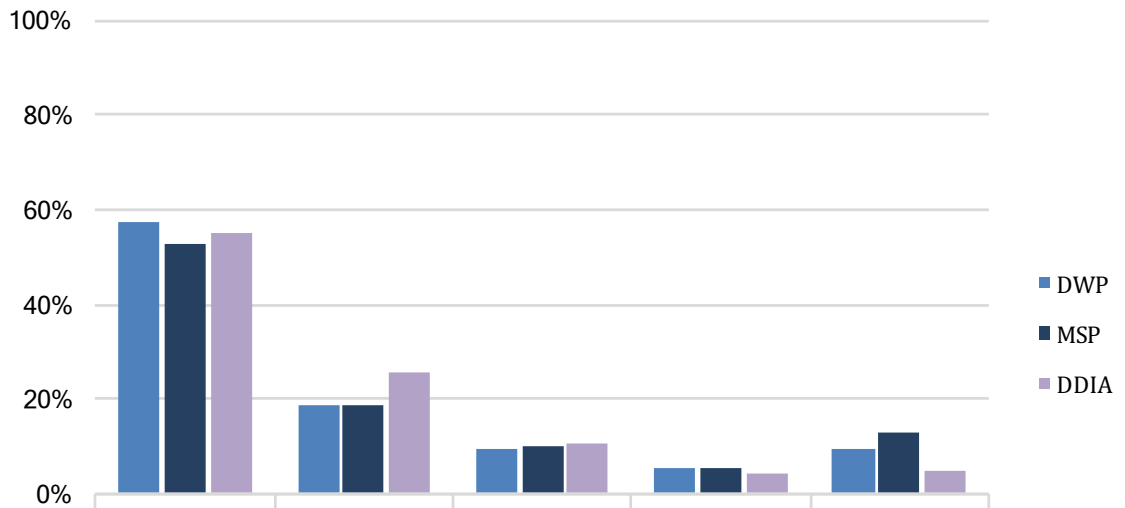
Table 8. Distance to treating primary care dentist by program, Year 2

	DWP N=37,954		MSP N=79,948		DDIA N=254,189	
	Distance (miles)	Time (minutes)	Distance (miles)	Time (minutes)	Distance (miles)	Time (minutes)
Mean (SD)	13.7 miles (24.4)	18.3 min (27.9)	16.2 miles (26.9)	21.1 min (30.6)	10.7 miles (19.2)	15.1 min (21.7)
Median	4.6	7.6	5.4	8.5	5.0	8.4
Range	0 – 365.4	0 – 350.2	0 – 393.9	0 – 387.0	0 – 416.1	0 – 416.0

In Year 2, 57% of DWP members traveled 5 miles or less for visits to their primary care dentist (Figure 11); approximately 10% traveled more than 35 miles. In comparison, 13% of MSP members and 4.6% of DDIA members traveled more than 35 miles.

It should be noted that outcomes describing distances traveled to a treating provider are partially a function of provider availability. For example, these outcomes do not capture information about members who were unable to find a dentist within acceptable travel distances or for reasons other than travel distance. Approximately 24% (n=37,954) of the DWP members in our study population had a primary care dental visit, compared to 70% (n=79,948) of adult MSP members and 52% (n=254,189) of DDIA members.

Figure 11. Distribution of members by travel distance to treating primary care dentist, Year 2



	0-5 miles	6-15 miles	16-25 miles	26-35 miles	>35 miles
DWP	57.1%	18.8%	9.3%	5.2%	9.7%
MSP	52.8%	18.6%	10.0%	5.7%	13.0%
DDIA	55.3%	25.5%	10.4%	4.2%	4.6%

Changes in Travel Distance, Year 1 to Year 2

During Year 1, DWP members travelled slightly farther on average than MSP members to visit a primary care dentist (19 miles vs. 16 miles, respectively). While mean travel distance and time has increased slightly for the MSP population since Year 1, travel distance has decreased on average for the DWP member population.

Year 1 comparisons with adult MSP members were limited to newly enrolled MSP members in order to increase comparability with the DWP population. Year 2 comparisons do not limit the study populations in this manner. Please note that Year 1 distance comparisons with the DDIA population are not available at this time due to computational limitations.

Public Safety Net Availability

A list of public safety net dental providers that were active during Year 2 is provided in Table 9. Active providers include locations that submitted at least 1 claim to each program during the study period. A corresponding map (Figure 12) displays the location of each safety net provider, numbered to correspond with the Table 9 key.

During Year 2, 14 Federally Qualified Health Centers (FQHCs) in 3 states provided dental services to DWP members. There was substantial overlap with MSP dental safety net providers and DDIA. Data for safety net providers out of state were not available for DDIA (indicated by the shaded cells in Table 9).

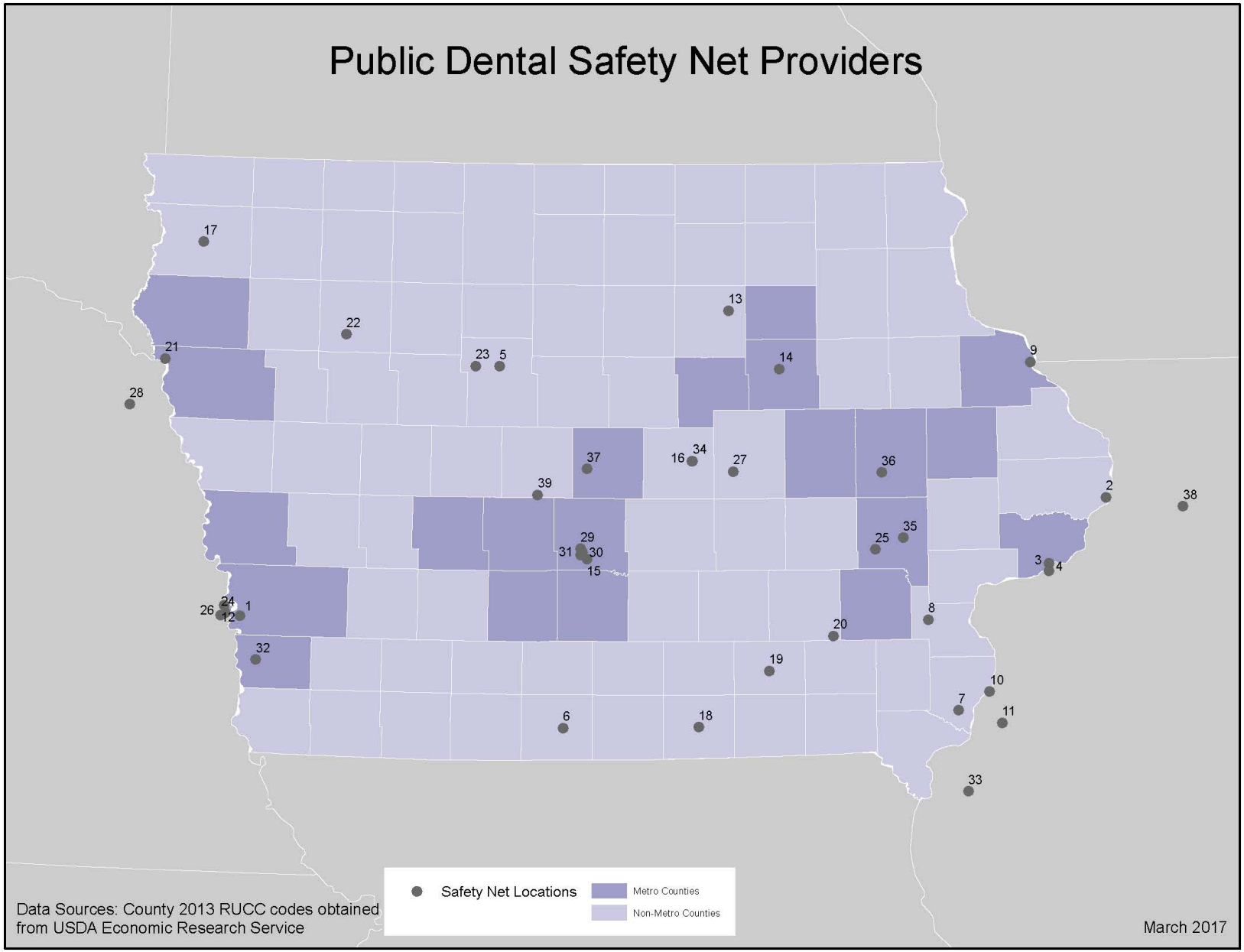
Table 9. Active public safety net providers by site, Year 2

Key	Clinic Name	Location	DWP	MSP	DDIA
	Federally Qualified Health Centers (FQHCs)				
1	All Care Health Centers	Council Bluffs, IA	X	X	X
2 3	Community Health Care Inc.	Clinton, IA Davenport, IA	X X	X X	X
4	Community Health Care Inc.	Rock Island, IL	X		
5	Community Health Center of Ft. Dodge	Fort Dodge, IA	X	X	X
6	Community Health Center of Southern Iowa	Leon, IA	X	X	X
7 8	Community Health Centers of Southeastern Iowa	Burlington, IA Columbus City, IA	X X	X	X X
9	Crescent Community Health Center	Dubuque, IA	X	X	X
10 11	Eagle View Community Health System	Oquawka, IL Stronghurst, IL	X X	X	
12	OneWorld Community Health Center	Omaha, NE		X	
13 14	Peoples Community Health Clinic	Clarksville, IA Waterloo, IA	 X	 X	X X
15 16	Primary Health Care Inc.	Des Moines, IA Marshalltown, IA	X	X	X
17	Promise Community Health Center Inc.	Sioux Center, IA	X	X	X
18 19 20	River Hills Community Health Center	Centerville, IA Ottumwa, IA Richland, IA	X X X	X	X X
21	Siouxland Community Health Center	Sioux City, IA	X	X	X
22	United Community Health Center	Storm Lake, IA	X	X	X
	Academic Institutions				
23	Iowa Central Community College	Fort Dodge, IA		X	X
24	Creighton University Dental Clinic	Omaha, NE		X	
25	UIHC Hospital Dentistry Institute	Iowa City, IA	X	X	X
25	University of Iowa College of Dentistry & Dental Clinics	Iowa City, IA	X	X	X
26	University of Nebraska Medical Center Adult General Dentistry	Omaha, NE	X	X	
26	University of Nebraska Medical Center Dental Plan	Omaha, NE	X	X	

Table 9. Continued

	Indian Health Services				
27	Meskwaki Dental Health Clinic	Tama, IA	X	X	X
28	Winnebago Tribe of Nebraska Dental Clinic	Winnebago, NE	X	X	
	Non-FQHC Community Health Center or Other Non-Profit				
29	Broadlawns Medical Center	Des Moines, IA	X	X	X
30 **31**	Des Moines Health Center	Des Moines, IA Des Moines, IA	X X	X X	X
32	Glenwood State Hospital (Glenwood Resource Center)	Glenwood, IA			X
33	Hancock County Health Department	Carthage, IL		X	
34	Marshalltown Medical Center (Central Iowa Healthcare)	Marshalltown, IA		X	
35	Mercy Hospital	Iowa City, IA			X
36	St. Luke's Dental Health Center	Cedar Rapids, IA	X	X	
37	Story County Dental Clinic (Mid-Iowa Community Action)	Ames, IA	X	X	X
38	Whiteside County Community Health Center	Rock Falls, IL	X		
39	Woodward Resource Center	Woodward, IA			X

Figure 12. Locations of public safety net providers, Year 2



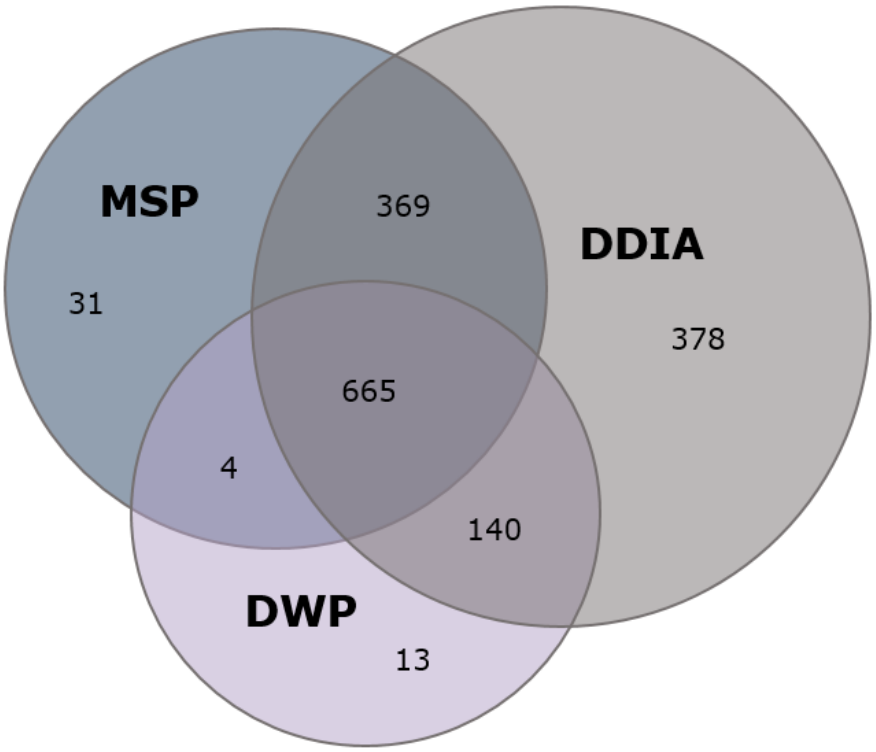
Provider Panel Overlap

Overlap between the DWP, MSP, and DDIA active dentist workforce by specialty is shown in Table 10. Overlap among all dentists is displayed in Figure 13. Out of 1,600 unique providers in Iowa, identified based on claims submission, 42% (n=665) were active providers in all 3 programs (DWP, MSP, and DDIA) during Year 2. Twenty-four percent of active DDIA providers (n=378) did not participate in either DWP or MSP during Year 2.

Table 10. Active dentist overlap by specialty, Year 2

	All Dentists	Primary Care Dentists	Endo-dontists	Oral Surgeons	Perio-dontists	Prostho-dontists
DWP only	13	11	0	1	0	1
Medicaid only	31	29	0	2	0	0
DDIA only	378	305	31	15	14	13
DWP + DDIA	140	123	8	2	5	2
DWP + MSP	4	4	0	0	0	0
MSP + DDIA	369	349	3	7	3	7
All 3 programs	665	593	4	52	5	11
TOTAL UNIQUE DENTISTS	1600	1411	46	79	27	34
DWP TOTAL	822	731	12	55	10	14
MSP TOTAL	1069	975	7	61	8	18
DDIA TOTAL	1552	1370	46	76	27	33

Figure 13. Active dentist overlap in the DWP, MSP, and DDIA, Year 2



Appendix A — Supplemental Tables

Table A1. Valid addresses of members by program, Year 2

	Year 2	
	Valid N (%)	Missing N (%)
DWP	161353 (96.2%)	6396 (3.8%)
MSP	1143237 (89.3%)	13653 (10.7%)
DDIA	451950 (94.4%)	26462 (6.6%)

Table A2. Sensitivity analysis comparing MSP county dentist to population ratios calculated using full-time equivalents (FTEs) versus counts of primary care dentists and members

	A	B	C
	County dentist difference (N – FTE)	County member difference (N – FTE)	County ratio difference (N – FTE)
	N=99	N=99	N=99
Mean	0.9	189.5	1.0
Median	0	76.9	1.1
Std. Dev.	1.9	393.4	1.8
Range	15.1	15.2	-4.3 – 5.6
Percentiles			
25	0	47.7	0
50	0	76.9	1.1
75	1.2	120.3	1.9
Sum	92.0	18756.7	99.0

A sensitivity analysis comparing dentist ratios calculated using MSP FTEs versus counts of members and dentists is shown in Table A2. Analyses examine ratios based on active primary care dentists (e.g., general and pediatric dentists) in the MSP provider network during Year 2 (May 2015 – April 2016). Active dentists are defined as any dentist who submitted at least one claim on behalf of an adult MSP member during the study period. The population includes adult MSP members enrolled for at least 1 month during the study period.

FTE dentists were calculated based on the number of practices listed in unique counties per dentist. A dentist with 2 practices located in 2 separate counties would contribute 0.5 dentist FTE to each county workforce supply. FTE members were calculated based on months of enrollment during the 1-year study period. An individual who was enrolled in MSP for 12 months would contribute 1.0 member FTE to each county population.

Column A displays descriptive statistics for the difference between county dentist supply calculated using headcounts of unique practice counties and FTEs. Hypothetically, if all dentists worked in only 1 county, the difference between headcounts and FTEs would be 0. In this dataset, the average county difference was 0.9. At the state level, counting each practice location equivalently would result in an overestimation of 92 FTEs. This would translate into an overestimation of approximately 9%, considering that there were 1012 FTE dentists in the study population.

Column B displays information about difference between county member populations calculated using headcounts and FTEs. Member headcounts result in an average of additional 189.5 members per county and 18,757 members for the entire state when compared with FTE adjustments.

Overall, adjusting for FTEs of dentists and members resulted in higher dentist to population ratios for 74 out of 99 counties. These higher ratios ranged from .01 to 5.6 additional primary care dentists per 1,000 members, with 53 counties gaining at least 1 FTE dentist using these adjustments. Ratios were increased over count ratios primarily due to the large differences in member FTEs versus headcounts.

Appendix B — Delta Dental of Iowa commercially-insured adult population, Year 1

Enrollment, provider network, and claims data for the DDIA Year 1 population were not available previously. We report basic demographic and provider characteristics in this appendix to enable comparisons with Year 2 findings.

Table B1. Demographic characteristics of DDIA members in Year 1 (2014-2015)

	DDIA
	Number (%)
Sex*	
Female	254,201 (52.9%)
Male	223,380 (46.5%)
Age	
19-20 years	10,828 (2.3%)
21-30	115,943 (24.1%)
31-40	104,561 (21.8%)
41-50	101,653 (21.2%)
51-64	147,563 (30.7%)
County Urbanicity	
Metropolitan	313,559 (65.3%)
Non-metropolitan	166,989 (34.7%)
Total	**480,548**

**Counts may not add up to total due to missing information on sex*

Table B2. Active DDIA dentists by specialty, Year 1

	Total	Private Practice	Safety Net
	N (%)	N	N
General Dentists	1337 (85.7%)	1248	117
Endodontists	46 (2.9)	40	6
Oral Surgeons	71 (4.6)	64	11
Pediatric Dentists	44 (2.8)	39	7
Periodontists	27 (1.7)	20	7
Prosthodontists	35 (2.2)	15	21
Total	**1,560 (100)**	**1426**	**169**

Table B3. DDIA county primary care dentist FTEs and ratios by, Year 1 (N=99)

	FTEs	Dentist FTEs per 1,000 FTE members
Mean	14.0	3.9
Median	6.0	3.7
Std. Dev.	29.3	1.9
Range	0-233.7	0-9.8
Percentiles		
25	3.0	2.5
50	6.0	3.7
75	10.0	5.1
Sum	1382.0	

Appendix C — County dentist to population ratios, Year 2

Table C1. Active primary care dentist to population ratios* by county, Year 2

	DWP		MSP		DDIA	
	Primary care dentists (FTEs)	*Dentists per 1000 members*	*Primary care dentists (FTEs)*	*Dentists per 1000 members*	*Primary care dentists (FTEs)*	*Dentists per 1000 members*
Adair	1.0	5.3	2.0	12.9	3.0	5.3
Adams	1.5	13.4	2.5	20.9	1.5	3.6
Allamakee	.0	.0	4.0	16.3	5.5	7.7
Appanoose	2.0	3.0	4.5	6.4	5.5	7.4
Audubon	1.0	5.1	1.0	6.7	1.0	1.6
Benton	4.0	5.9	4.0	6.5	5.0	1.6
Black Hawk	42.3	7.3	47.5	8.8	68.2	4.9
Boone	2.0	2.6	10.0	14.5	8.8	1.7
Bremer	4.0	8.7	7.5	20.7	9.0	3.3
Buchanan	5.0	8.9	2.0	3.9	5.0	2.0
Buena Vista	4.2	6.6	5.8	10.9	9.5	7.2
Butler	4.0	10.8	3.0	9.3	3.5	2.3
Calhoun	2.0	7.6	2.0	9.0	3.0	2.7
Carroll	8.0	10.8	11.0	17.9	11.6	3.8
Cass	3.0	6.7	2.0	3.6	8.3	7.2
Cedar	7.0	17.9	3.0	9.8	7.5	2.7
Cerro Gordo	15.5	9.0	24.0	14.3	33.6	6.8
Cherokee	2.8	8.0	3.5	13.6	3.7	2.7
Chickasaw	.0	.0	3.0	12.5	4.0	4.4
Clarke	.0	.0	2.0	6.1	5.1	5.6
Clay	2.0	3.7	5.5	12.5	10.1	7.1
Clayton	4.0	11.8	6.5	24.1	7.0	7.6
Clinton	15.0	6.7	17.0	7.9	26.0	6.7
Crawford	1.5	3.2	6.0	16.8	3.5	3.4
Dallas	7.5	5.8	8.0	8.2	33.6	4.6
Davis	2.0	6.8	1.0	4.4	2.3	4.2
Decatur	4.0	9.5	2.0	8.5	2.3	5.4
Delaware	6.0	16.3	5.0	12.1	6.5	3.4
Des Moines	8.2	3.9	8.3	4.4	18.1	5.1
Dickinson	3.8	9.5	5.8	18.4	10.2	8.0
Dubuque	34.0	11.7	46.5	15.1	73.1	9.3
Emmet	2.0	6.8	3.0	10.0	3.0	3.4

**Based on member and dentist full time equivalents (FTEs)*

Table C1. Continued

	DWP		MSP		DDIA	
	Primary care dentists (FTEs)	*Dentists per 1000 members*	*Primary care dentists (FTEs)*	*Dentists per 1000 members*	*Primary care dentists (FTEs)*	*Dentists per 1000 members*
Fayette	5.0	6.7	7.5	9.5	8.7	7.0
Floyd	6.0	9.9	6.5	11.2	7.0	4.0
Franklin	1.8	7.8	2.3	11.3	4.3	4.5
Fremont	1.0	5.2	1.0	5.1	1.0	2.0
Greene	.0	.0	2.0	6.9	2.0	1.5
Grundy	2.0	8.8	2.0	12.6	2.0	1.5
Guthrie	2.0	7.1	3.0	13.1	2.0	1.8
Hamilton	1.0	2.3	3.0	8.0	6.5	3.7
Hancock	4.0	16.4	4.0	18.8	4.0	2.4
Hardin	7.0	11.6	6.0	12.2	7.8	4.0
Harrison	7.5	16.0	6.5	16.5	7.5	9.8
Henry	5.8	7.7	4.8	7.0	7.9	2.7
Howard	.0	.0	2.0	8.4	2.0	3.7
Humboldt	.0	.0	2.5	11.6	3.0	3.6
Ida	2.0	9.5	2.0	13.8	2.5	3.1
Iowa	5.5	10.2	8.0	25.4	7.0	3.0
Jackson	7.0	11.1	8.0	14.1	8.0	5.8
Jasper	3.7	2.9	8.5	7.1	13.2	2.2
Jefferson	3.0	3.2	6.0	10.0	6.5	4.5
Johnson	60.8	15.1	87.0	34.1	171.0	5.9
Jones	2.5	4.5	4.0	7.9	5.3	2.2
Keokuk	1.5	4.3	3.5	11.8	1.0	.7
Kossuth	3.5	12.0	5.0	16.1	7.8	6.1
Lee	4.5	2.6	3.5	2.1	7.7	2.7
Linn	54.5	6.4	87.3	11.9	128.5	4.2
Louisa	3.5	9.5	3.0	10.3	3.5	3.8
Lucas	2.5	6.9	2.0	8.4	2.5	2.4
Lyon	2.0	12.1	3.0	20.4	4.0	6.1
Madison	2.0	5.0	2.0	7.5	4.3	2.0
Mahaska	2.0	2.5	4.0	5.0	6.3	1.9
Marion	9.0	10.1	13.0	17.7	20.1	2.8
Marshall	9.5	6.4	17.7	12.5	22.8	5.4
Mills	4.0	11.4	5.0	15.2	5.0	3.5
Mitchell	2.0	8.8	3.0	14.1	4.5	7.6
Monona	.0	.0	2.0	7.2	3.0	4.0

Table C1. Continued

	DWP		MSP		DDIA	
	Primary care dentists (FTEs)	*Dentists per 1000 members*	*Primary care dentists (FTEs)*	*Dentists per 1000 members*	*Primary care dentists (FTEs)*	*Dentists per 1000 members*
Monroe	.0	.0	1.5	5.9	3.3	3.1
Montgomery	2.0	4.7	2.0	4.4	3.0	3.7
Muscatine	9.5	5.4	12.0	7.2	15.4	1.8
Obrien	2.2	6.6	7.5	23.2	7.8	6.4
Osceola	.0	.0	.0	.0	1.0	2.9
Page	6.2	11.0	5.8	9.8	9.2	5.3
Palo Alto	1.5	5.7	2.5	12.2	3.0	3.7
Plymouth	3.8	7.4	8.0	18.2	9.7	2.8
Pocahontas	1.0	4.8	4.0	19.2	4.5	6.8
Polk	106.6	5.0	134.9	8.9	279.4	3.6
Pottawattamie	31.0	6.9	35.0	7.9	45.5	11.0
Poweshiek	6.5	13.3	8.0	19.0	8.0	2.8
Ringgold	.0	.0	.0	.0	.0	.0
Sac	1.0	5.1	3.0	17.4	3.5	5.2
Scott	38.5	4.5	52.0	7.1	111.7	6.7
Shelby	3.0	11.0	5.5	17.8	6.5	6.7
Sioux	7.7	16.5	7.3	18.4	13.7	4.3
Story	10.5	4.8	22.0	17.1	40.8	2.5
Tama	3.5	6.3	3.0	6.3	5.3	2.3
Taylor	1.5	7.1	.5	2.3	2.5	4.0
Union	3.0	5.5	4.0	8.6	4.0	2.7
Van Buren	.0	.0	1.0	5.6	1.0	2.8
Wapello	8.5	4.2	12.0	6.3	20.9	8.7
Warren	4.0	3.6	8.0	9.9	14.0	1.8
Washington	4.0	6.0	8.0	15.7	7.8	2.1
Wayne	2.0	8.6	3.0	15.5	2.0	5.1
Webster	6.0	3.3	14.5	8.3	22.2	5.4
Winnebago	4.0	15.6	6.0	26.1	8.0	3.8
Winneshiek	3.0	7.3	9.0	30.5	12.0	8.5
Woodbury	32.0	6.4	38.5	9.0	58.9	6.4
Worth	.0	.0	1.0	6.0	2.0	2.4
Wright	1.0	2.7	3.0	9.9	4.4	3.7