

HEALTHY BEHAVIORS COST ANALYSIS REPORT

Final Draft

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IMPORTANT NOTE

The Managed Care Organizations (MCOs) began operation on April 1, 2016. During the period April-September 2016 encounter data provided by the MCOs is incomplete, with data missing in key fields such as the DRG code and discharge date for hospitalizations. The proportion of encounters with missing data varies by MCO with AmeriGroup providing the most complete data during this time.

As of the fourth quarter of calendar year (CY) 2016, data is more complete, however key components such as discharge date, are still missing on a significant proportion of claims. In a recent study of family planning we found a dramatic fall in the deliveries during the second and third quarter of CY 2016. By comparing to previous yearly patterns, we can be certain that this fall is the result of missing data, and NOT the result of an actual fall in the number of deliveries during this time. We have not been able to complete audits of other care patterns, however. Thus, we are not using the CY 2016 claims data at this time.

BACKGROUND

On January 1, 2014 Iowa implemented the Iowa Health and Wellness Plan (IHAWP). IHAWP expands coverage for low income Iowans through two new programs: the Marketplace Choice and the Wellness Plan.

The **Wellness Plan** provides coverage for adults aged 19-64 years with income up to and including 100 percent of the Federal Poverty Level (FPL). It is administered by the Iowa Medicaid Enterprise (IME). Members will have access to the Medicaid provider network established for this program.

The **Marketplace Choice Plan** provides coverage for adults aged 19-64 years with income from 101-133 percent of the Federal Poverty Level (FPL). The Marketplace Choice Plan allows members to choose certain commercial health plans available on the health insurance marketplace, with Medicaid paying the member's commercial health plan premiums.

IHAWP replaces the IowaCare program with plans that cover more services, offer a broader provider network, and expand coverage to other low income adults in Iowa who were not previously enrolled in IowaCare.

OVERVIEW OF IOWA'S HEALTHY BEHAVIORS INCENTIVE (HBI) PROGRAM

As a part of both the **Wellness Plan** and the **Marketplace Choice Plan**, enrollees are encouraged to participate in an HBI program involving three components: 1) a wellness exam and health risk assessment (HRA), 2) provider incentives, and 3) healthy behaviors. This program is designed to:

- Empower members to make healthy behavior changes.
- Establish future members' healthy behaviors and rewards.
- Begin to integrate HRA data with providers for clinical decisions at or near the point of care.
- Encourage members to take specific proactive steps in managing their own health and provide educational support.
- Encourage providers to engage members in completion of the healthy behaviors by offering incentive payments.

Starting in 2015, a small monthly contribution by the member may be required depending on family income, although there are no copayments for health care services and prescriptions under the plan. Some Wellness Plan members will contribute \$5 per month, while Iowa Marketplace Choice Plan members will contribute \$10 per month. Wellness Plan members with individual earnings less than 50 percent of the Federal Poverty Level (\$5,885 per year for an individual, or \$7,965 for a family of 2 in 2015) will not have monthly contributions. IHAWP members who complete the wellness exam and the HRA will not be responsible for a monthly contribution.

The most recent survey results indicate that 60% of IHAWP members were not aware that completing a wellness exam would exempt them from the monthly monetary contributions.

Members earning over 49% of the FPL are given a 30-day grace period after the enrollment year to complete the healthy behaviors (wellness exam and HRA) in order to have the contribution waived. If members do not complete the behaviors after the grace period has ended, members will receive a billing statement and a request for a hardship exemption form. For members of the Wellness Plan, all unpaid contributions will be considered a debt owed to the State of Iowa but will not, however, result in termination from the Wellness Plan. If, at the time of reenrollment, the member does not reapply for or is no longer eligible for Medicaid coverage and has no claims for services after the last premium payment, the member's debt will be forgiven. For members in Marketplace Choice, unpaid contributions after 90 days will result in the termination of the member's enrollment status. The member's outstanding contributions will be considered a collectable debt and subject to recovery. A member whose Marketplace Choice Plan benefits are terminated for nonpayment of monthly contributions must reapply for Medicaid coverage. The IME will permit the member to reapply at any time; however, the member's outstanding contribution payments will remain subject to recovery.

WELLNESS EXAM

The wellness exam is an annual preventive visit (New Patient CPT Codes: 99385 18-39 years of age, 99386 40-64 years of age; Established Patient CPT Codes: 99395 18-39 years of age, 99396 40-64 years of age) from any plan-enrolled physician, Rural Health Clinic (RHC), Federally Qualified Health Center (FQHC) or Advanced Registered Nurse Practitioner (ARNP). The exams are part of the preventive services covered by the plans and therefore do not cost the member anything out-of-pocket. A 'sick visit' or chronic care visit can count towards the requirement of the preventive exam, if wellness visit components are included and the billing code modifier 25 is used.

HEALTH RISK ASSESSMENT

A health risk assessment (HRA) is a survey tool that can be used by members and providers to evaluate a member's health. IME has identified Assess My Health as one such tool, although providers can select their own tool if it asks similar questions (although they would not be reimbursed in this case). Assess My Health is an online form that takes members between 15 and 40 minutes to complete. Wellness Plan members who complete the assessment receive a one-page report and their provider is able to receive a report automatically. Members of the Marketplace Choice Plan also receive the report, but their provider does not auto-

matically receive the report; Marketplace Choice Plan enrollees must share the report with their provider. HRA information can be used by providers to develop plans addressing member needs related to health risks. The HRA may be completed online at any location, including the health care provider's office. Clinics can contact patients to fill out the HRA over the phone, with the clinic inputting the data into the online system.

PROVIDER INCENTIVES

Providers also have incentives available to them to encourage and support their patients in completing the wellness exam and HRA. For every Wellness Plan member who completes the HRA with the assistance of the provider, the provider receives \$25. The only HRA that qualifies for this incentive is the Assess My Health tool.

FURTHER BEHAVIOR INCENTIVES

A program of incentives will be developed to encourage behavior change among enrollees. To participate in this part of the program, the member must have completed the wellness exam and the HRA, unless they are below 50% of the FPL or are Medically Exempt status. This part of the program was not implemented, but has been replaced by rewards programs being operated by the three managed care organizations contracted by the state.

OBJECTIVE OF THE CURRENT EVALUATION REPORT

The objective of our analyses for this report was to gain a better understanding of the relationship between completion of healthy behaviors and several measures of healthcare costs. While the HBI program is intended to encourage enrollees to take an active part in maintaining their health, our prior reports evaluating completion rates of HBI activities among members and awareness of the program among both members and providers revealed low participation rates and a general lack of awareness and understanding about the program at the enrollee and provider level. Ultimately, what we would like to demonstrate here is that—for those who completed healthy behaviors—healthcare costs decreased. We present our results here in two chapters. The first examines bivariate analyses showing the relationship between our outcomes of interest and differing levels of healthy behavior completion as well as incremental cost effectiveness ratios. The second examines multiple regression models in a difference-in-differences framework using a unique subsample of Medicaid members.

METHODOLOGY FOR BIVARIATE ANALYSES AND INCREMENTAL COST EFFECTIVENESS RATIOS

DATA SOURCES

Data for the current quantitative analysis of the Healthy Behaviors Evaluation were derived from two sources: Medicaid enrollment and claims data from January 2012 to December 2015, and Department of Human Services records on completion of wellness exams and health risk assessments in CY 2014 and 2015. Data for 2012 and 2013 include members enrolled in IowaCare. As of January 1, 2014, the IowaCare program was discontinued, so there are no IowaCare members in the 2014 or 2015 data. However, there are now Wellness Plan and Marketplace Choice members present in those years of the data. The 2014 and 2015 data from DHS are specific to these IHAWP members.

STUDY POPULATION AND COMPARISON GROUPS

As discussed in the evaluation proposal, the focus of this evaluation is the examination of differences in outcomes associated with the completion of healthy behaviors among Iowa Wellness Plan and Marketplace Choice Plan members and other comparison groups outlined below. Because there may be differences between the members in the Wellness Plan and the Marketplace Choice Plan, the evaluation documents and compares program outcomes for these groups as well.

The **Wellness Plan** provides coverage for adults aged 19–64 years with income up to and including 100 percent of the Federal Poverty Level (FPL). It is administered by the Iowa Medicaid Enterprise (IME). Members will have access to the Medicaid provider network established for this program. Depending on their county of residence, Wellness Plan members may be enrolled in one of three programs: fee-for-service, HMO (Health Maintenance Organization), or Wellness Plan PCP (Primary Care Provider).

The **Marketplace Choice Plan** provides coverage for adults aged 19–64 years and members enrolled via three methods: 1) approximately 6,700 people previously enrolled in IowaCare who had incomes from 101 to 133% FPL, 2) people who have been enrolled in Medicaid but due to increased income are now eligible for the Marketplace Choice Plan, and 3) those who have never been in a public insurance program but meet the income eligibility for Marketplace Choice (101–133% FPL).

Comparison Group: IowaCare

The comparison group consists of former IowaCare enrollees. IowaCare was a limited provider/limited benefit program that operated from 2005–2013. The provider network included one public hospital in Des Moines, a large teaching hospital in Iowa City and 6 federally qualified health centers. It was for adults, not otherwise eligible for Medicaid, with incomes up to 200% FPL. IowaCare enrollees were distributed in three places following the elimination of this program: 1) those with incomes 101–133% FPL were enrolled into Marketplace Choice, 2) those with incomes 0–100% FPL were enrolled in Wellness Plan, and 3) those whose income could not be verified were not enrolled in any program.

ASSIGNING MEDICAID PLAN MEMBERS TO PROGRAMS

Before proceeding with analyses, we assigned members to one of the four groups listed above. For CY 2012 and CY 2013, they could be assigned to IowaCare, while during CY 2014 and CY 2015, they could be assigned to the Wellness Plan, or the Marketplace Choice Plan. Starting with monthly data, we used a rolling cohort method to attribute members to a program. We did this by identifying the first 12 consecutive months in which a member was continuously and exclusively enrolled in a given program. For example, a member enrolled January 2012 through December 2012 would be in cohort 1, while a member enrolled February 2012 through January 2013 would be in cohort 2, and so on. If a member was enrolled for additional 12 month periods beyond their initial 12 months (e.g., a total of 24, 36, or 48 months' worth of enrollment), the counter would start over and they would be included in those cohorts as well. For example, a member enrolled March 2012 through February 2014 would be in cohort 3 from March 2012 to February 2013, and cohort 15 from March 2013 to February 2014, and so on. Essentially, the cohort corresponds to the study month in which the member's 12-month continuous enrollment begins, and they enter a new cohort for each successive 12-month period. However, we did not keep partial years of data. For example, if a member was enrolled for 18 months, we kept only their initial 12 months, and dropped the other 6. After assigning members to cohorts, we collapsed the data to provide one observation per person per cohort. This method ensures that

we retain as many Medicaid members in our sample as possible, while also ensuring that all members in our sample are exposed to a full year of the program to which they are assigned, providing them equal opportunity to engage in HBI program activities, and corresponding to the period of time they have to complete activities before being charged a premium (excluding the additional 30-day grace period).

IDENTIFICATION OF HEALTHY BEHAVIORS

Because we sought to ensure that we used the most generous measure of healthy behavior completion possible, we used both Medicaid claims data and DHS data to identify receipt of a wellness exam and HRA completion. If a member was identified as completing an activity in either of these datasets, we counted that activity. Medicaid claims data allow us to identify wellness exams, but not HRAs. However, the DHS data identify many additional cases of reported wellness exams that are not reflected in the claims data. We primarily relied on the DHS data to identify HRA completion.

BIVARIATE ANALYSES

Using all years of available data (2012 – 2015) we calculated both total medical costs and total claims costs among the Wellness Plan and Marketplace Choice plan members and the IowaCare comparison group. Total medical costs include the claims for provider fees, inpatient and outpatient facility charges, and pharmaceuticals. Total claims costs include total medical costs plus claims for dental care, waiver-based services, and nursing home care. We then compared costs within the groups based on members' completion of either one or both of the healthy behaviors (i.e., HRA and/or wellness exam). T-tests were used to compare the means between members within a program who completed versus did not complete healthy behaviors. All differences were statistically significant at $p < 0.001$ unless otherwise noted in the results.

INCREMENTAL COST EFFECTIVENESS RATIOS

Cost effectiveness analyses combine the costs of care with quality and access to determine whether changes in cost, even if positive, resulted in better quality and/or access providing either cost-savings or at least a better value for each additional dollar spent. Incremental cost effectiveness ratios (ICER) are established by taking the difference in outcome between the treatment group (i.e., those who completed both healthy behaviors in both years) and the control group (i.e., those who completed none of the healthy behaviors in either year) over the difference in cost between the treatment group and the control group. We calculated the ICERs by year using a mixture of total Medicaid claim costs and inpatient claim costs. A change in the ICER between the pre-and-post HBI periods (2012 and 2013 vs. 2014 and 2015) serves as an indications of the cost-effectiveness of the program. In particular, we examine ICERs for the following measures:

Measure 11A Adult access to preventive/ambulatory health services

$$\frac{\text{Total Cost}_{\text{(HBI)}} - \text{Total Cost}_{\text{(NP)}}}{\text{Adult Access}_{\text{(HBI)}} - \text{Adult Access}_{\text{(NP)}}}$$

$$\frac{\text{Inpatient Cost}_{\text{(HBI)}} - \text{Inpatient Cost}_{\text{(NP)}}}{\text{Adult Access}_{\text{(HBI)}} - \text{Adult Access}_{\text{(NP)}}}$$

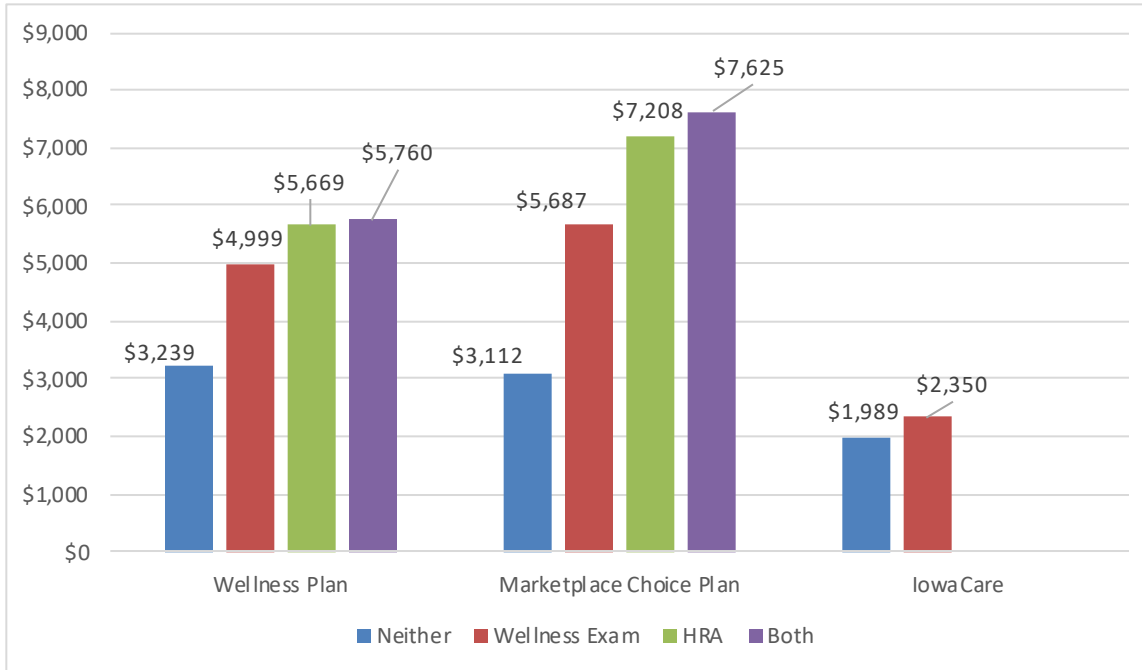
Measure 31A Non-emergent ED use

$$\frac{\text{Total Cost}_{\text{(HBI)}} - \text{Total Cost}_{\text{(NP)}}}{\text{Non-emergent ED Use}_{\text{(HBI)}} - \text{Non-emergent ED Use}_{\text{(NP)}}}$$

RESULTS OF BIVARIATE ANALYSES

Figure 1 compares Medicaid members within each group, by completion of a wellness exam and/or HRA. We see that total medical costs typically increase as members complete more healthy behaviors. Some of this is likely to be attributable to the fact that completion of healthy behaviors likely required or resulted from an ambulatory care visit. Costs were lowest among the IowaCare population, followed by the Wellness Plan, and Marketplace Choice population.

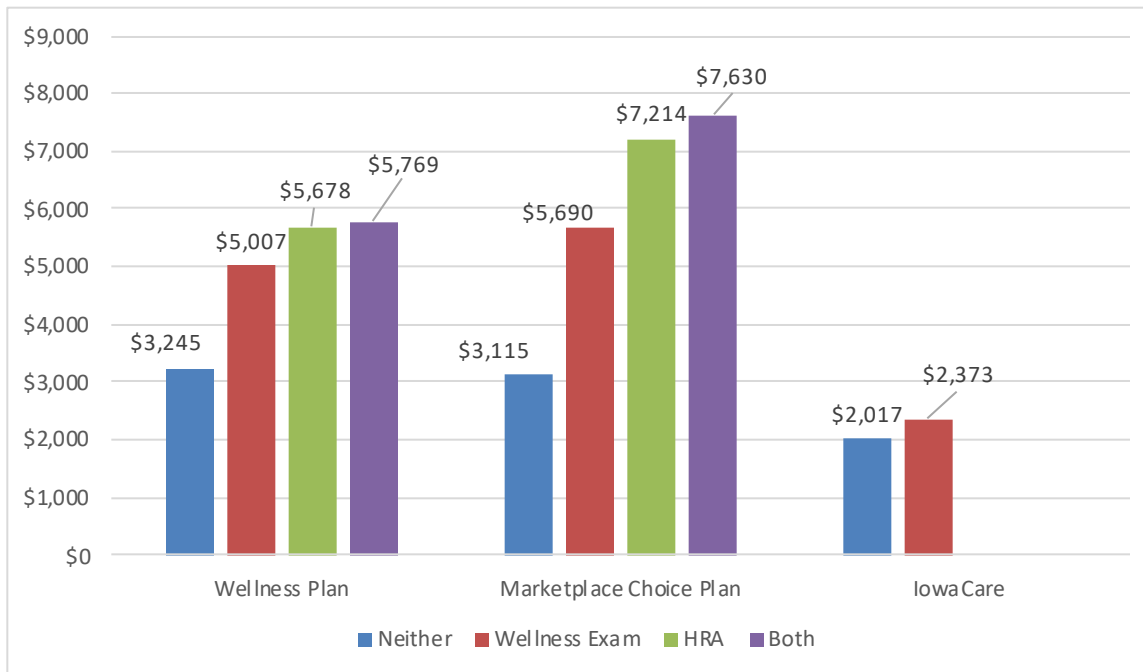
Figure 1. Total Medical Cost, by Group and Healthy Behavior Completion



Note: All differences within program are significant at $p < 0.05$.

Figure 2 replicates Figure 1, but examines total Medicaid costs (including dental, waiver-based, and nursing home claims in addition to medical claims). As expected, these amounts are slightly larger, but the general patterns remain consistent.

Figure 2. Total Cost, by Group and Healthy Behavior Completion



Note: All differences within program are significant at $p < 0.05$

RESULTS OF INCREMENTAL COST EFFECTIVENESS RATIO ANALYSIS

Table 1 presents the results of several incremental cost effectiveness ratios (ICERs) calculated by year. **The green-shaded cells indicate unequivocally cost-effective results, as the incremental costs were lower, while access was improved in the treatment group.** In the context of nonemergent ED visits, the treatment group spent more, but had fewer nonemergent ED visits. However, because nonemergent ED visits are considered a potentially undesirable outcome, we interpret this positively as reflecting the cost to reduce nonemergent ED visits by 1 per year. In the non-shaded cells, both incremental costs and access were higher in the treatment group. The ICERs related to ambulatory care (Measure 11A) would typically be considered cost-effective according to most standards, while the ICERs related to nonemergent ED visits (Measure 31A) would be considered non-cost-effectives according to most standards. **Taken together, these results suggest that individuals who are compliant with the HBI requirements are spending more on their health care, while utilizing less inpatient and nonemergent ED care, but more ambulatory care.**

Table 1. Incremental Cost Effectiveness Ratios

Measure	2012	2013	2014	2015
11A - Total Costs/Ambulatory Care	3378.56	4692.71	6742.15	2521.41
11A - Inpatient Costs/Ambulatory Care	106.17	770.71	-408.95	-366.47
31A - Total Costs/Nonemergent ED	60814	37541.67	-16855.38	-24493.71

METHODOLOGY FOR DIFFERENCE-IN-DIFFERENCES ANALYSES

DATA SOURCES AND ASSIGNMENT OF MEDICAID PLAN MEMBERS TO PROGRAMS

For our difference-in-differences regression models, we used the same data as described earlier in this report. We also used the same rolling cohort method to assign members to a specific program, and the same method of identifying the completion of healthy behaviors.

STUDY POPULATION AND COMPARISON GROUP

The difference-in-differences approach works by identifying a treatment group (completed healthy behaviors) and a control group (did not complete healthy behaviors), and following them over a period of time both before and after the implementation of the intervention, which in this case is the introduction of the Healthy Behaviors Program. This method adjusts for baseline differences between the treatment and control groups, and then identifies any additional difference among the treatment group once the intervention has been implemented. This additional difference can then be attributed to the intervention itself.

Compared to our bivariate analyses, in which members could be in cohorts that spanned calendar years, the sample for our difference-in-differences analyses was limited to members in cohorts 1, 13, 25, and 37, corresponding to enrollment beginning in January of 2012, 2013, 2014, and 2015, respectively, and continuing through December of each of those years. This was essential to ensure that members did not span calendar years, since the intervention (introduction of the Healthy Behaviors Program) occurred on January 1, 2014. We also required members to be enrolled in all 4 years of the data to generate a stable sample both pre- and post-implementation of the Healthy Behaviors Program.

For these analyses, we used a very conservative method of assigning members to the treatment group, which maximizes our likelihood of identifying a relationship between healthy behavior completion and our outcomes of interest. The **treatment group** consisted of members who were in IowaCare in CY 2012 and CY 2013 and either the Wellness Plan or Marketplace Choice in CY 2014 and CY 2015, and who completed both a wellness exam and an HRA in both 2014 and 2015. The **control group** consisted of members who were in IowaCare in CY 2012 and CY 2013 and either the Wellness Plan or Marketplace Choice in CY 2014 and CY 2015, and who did not complete any healthy behaviors in either 2014 or 2015. Members who completed some healthy behaviors were excluded, as were IowaCare members with incomes above 133% FPL who were ineligible for the Wellness Plan or Marketplace Choice.

MULTIPLE REGRESSION MODELING

We used a difference-in-differences (DID) framework to isolate the effect of the intervention (completion of both HRA and wellness exam) among the treatment group, using the following model:

Where is a dummy variable for observations after the program has taken effect (in 2014), identifies an average individual constant term, and is an indicator variable that captures whether the individual was in the treatment group. As described above, we defined our sample to include individuals who were in our data continually from January 2012 through December 2015. Within each year we required individuals to have been enrolled for 12 months in either IowaCare (2012 and 2013) or the Wellness Plan or Marketplace Choice Plan (2014 and 2015). Our treatment group included individuals in our sample who completed both healthy behaviors in 2014 and 2015. Our control group included individuals in our sample who did not complete any healthy behaviors in 2014 and 2015. We excluded individuals in IowaCare who reported an income above 133% of the federal poverty level, because these individuals would have transitioned to subsidized insurance through the health insurance exchange or another form of insurance, but would not have been eligible for the Wellness Plan or Marketplace Choice Plan. We also excluded individuals who completed some of the healthy behaviors, but failed to complete both activities in both 2014 and 2015.

The coefficient on the interaction term is our primary parameter of interest, as it captures the change in the outcome among the treatment group after the treatment is implemented. In other words, this will demonstrate how outcomes changed for individuals who completed both a wellness exam and an HRA in 2014 and 2015. We also control for a variety of covariates, X , including age, gender, race, rurality of residence (based on rural-urban continuum codes), number of changes in residence within the year, number of ED visits, number of prescription medications, and a count of the number of conditions from a list of

24 commonly tracked chronic conditions for which a member has been diagnosed. For these models, we included individuals who were in our dataset for all four years (2012 – 2015). All analyses were conducted as linear probability models at the person-year level within the DID framework.

RESULTS OF DIFFERENCE-IN-DIFFERENCES ANALYSES

Our difference-in-differences model for total medical costs (shown in Table 2 below) indicated that completing both healthy behaviors in both years (i.e., the effect of being in the treatment group during the post-expansion period) had no effect on total medical costs. Baseline spending was comparable in both groups, but increased by approximately \$1340 after the implementation of the HBI program, likely reflecting an increase in utilization resulting from improved access with the expansion of the provider network as individuals transitioned from IowaCare to the Medicaid expansion. Other factors in the model were also significant as shown in Table 2.

Table 2. Modeling Total Medical Costs as a Function of Healthy Behavior Completion

	Coefficient	95% CI
Post Medicaid Expansion	1339.64***	821.65, 1857.63
Treatment Group	129.33	-568.08, 826.75
Post Medicaid Expansion*Treatment Group	-400.27	-1381.09, 580.55
Age	23.34*	1.78, 44.90
Male	282.93	-140.27, 706.14
Black	-1079.59*	-1980.75, -178.43
Hispanic	-979.17	-2412.87, 454.53
Other Race	-793.64	-2002.69, 415.42
Unknown Race	-29.88	-503.02, 443.25
Metropolitan	-660.55**	-1111.53, -209.57
Nonmetropolitan Rural	386.33	-653.01, 1425.66
Number of Relocations	66.24	-95.42, 227.89
Number ER Visits	1185.53***	1037.85, 1333.22
Number of Rx Drugs	977.03***	872.62, 1081.44
Number of 24 Chronic Conditions	1285.42***	1134.55, 1436.28
Constant	-910.34	-2035.97, 215.28

* p<0.05, ** p<0.01, ***p<0.001

Table 3 provides the results of our difference-in-differences model for total costs. **These results indicate that the effect of completing both healthy behaviors in both years (i.e., the effect of being in the treatment group during the post-expansion period) had no effect on total Medicaid costs during the year.** However, the results of this model were very consistent with those for medical costs alone, as can be seen by comparing the results of Tables 2 and 3.

Table 3. Modeling Total Costs as a Function of Healthy Behavior Completion

	Coefficient	95% CI
Post Medicaid Expansion	1307.50***	788.15, 1826.85
Treatment Group	121.44	-578.12, 821.00
Post Medicaid Expansion*Treatment Group	-393.19	-1376.83, 590.45
Age	23.52*	1.90, 45.14
Male	288.95	-135.47, 713.37
Black	-1085.41*	-1989.41, -181.41
Hispanic	-979.59	-2417.72, 458.54
Other Race	-800.66	-2013.35, 412.03
Unknown Race	-31.55	-506.15, 443.05
Metropolitan	-656.82**	-1109.14, -204.51
Nonmetropolitan Rural	374.91	-667.68, 1417.51

	Coefficient	95% CI
Number of Relocations	85.22	-74.81, 245.26
Number ER Visits	1185.89***	1037.72, 1334.07
Number of Rx Drugs	979.89***	875.16, 1084.61
Number of 24 Chronic Conditions	1293.98***	1142.65, 1445.30
Constant	-906.49	-2035.28, 222.30

* p<0.05, ** p<0.01, ***p<0.001

LIMITATIONS AND DEVIATIONS FROM PROPOSED METHODS

The quantitative analyses are limited in three ways. First, the definition of our sample and the treatment variable, while necessary to cleanly model the relationship between the Healthy Behaviors Program and our outcomes of interest using a quasi-experimental method, results in dropping a number of member-year observations. In turn, this raises the possibility that our results are not generalizable to other Wellness Plan and Marketplace Choice Plan members, or the general Medicaid population. Second, we cannot adequately control for the temporal relationship between completing healthy behaviors and subsequent healthcare utilization that drives costs. That is, we do not know whether the spending occurred before or after the completion of the healthy behavior(s). Our regression models are limited by the fact that there may be unobserved factors that differ between individuals, for which we are unable to adequately adjust our models. This may bias our results. However, the direction and magnitude of any such bias cannot be well predicted, and we do not formally test the assumption that trends are equal between the treatment and control group in the pre-period here. As with all evaluations, there will be limitations to the interpretation of these results and possible biases if comparison groups are not similar to the treatment groups. Finally, administrative data are collected for billing and tracking purposes and may not always accurately reflect the service provided.

A number of outcomes that we originally proposed are not reported here. We were unable to calculate the ICER for primary care costs for Measure 11A, as we did not have an indicator to attribute costs to primary care-specific outpatient care. Similarly, we were unable to calculate the ICER for primary care costs, ED costs, and specialist costs for Measure 31A. Finally, we were unable to evaluate Measure 36, as we lacked information on admission rates for diabetic and asthmatic patients. Furthermore, based on feedback from Mathematica that the regression discontinuity design (RDD) models were best conducted around the 100% of poverty threshold to compare Wellness Plan and Marketplace Choice members, we did not estimate any RDD models here, because we did not have a continuous variable that we could identify as assigning someone to treatment, which in this case is considered the completion of both healthy behaviors.

CONCLUSIONS

The HBI program is designed to encourage enrollees to take an active part in maintaining their health and to promote accountability among enrollees, but our prior reports have noted that the combination of a general lack of awareness and understanding about the program at the enrollee and provider level have stunted the program's ability to achieve significant participation. In the current report, we examine the costs and cost-effectiveness associated with the implementation of the HBI program.

Overall, we see from our bivariate analyses that completion of healthy behaviors, the wellness exam and HRA, is associated with a higher level of medical and total Medicaid spending. The direction of this association is unclear, as it may be the case that individuals who utilize more health care (and thus have higher costs) have more opportunities to complete the required HBI activities, rather than completion of the activities driving health care spending. Incremental cost effectiveness ratios allow us to examine relative differences in spending in the context of relative differences in utilization. From these analyses, it appears that the HBI program is cost-effective with regard to increasing ambulatory care while decreasing inpatient spending and nonemergent ED visits. However, it is important to note that none of these results control for potentially confounding variables.

For that reason, the most empirically robust results come from our difference-in-differences models. These models allow us to limit our sample to individuals who were enrolled in IowaCare for 24 months in 2012 and 2013 before transitioning to the Wellness Plan or Marketplace Choice Plan for 24 months in 2014 and 2015, and compare the treatment group (i.e., those who completed both healthy behavior activities in both 2014 and 2015) with a control group that completed none of the healthy behavior activities. Thus, we are able to isolate the contribution of completing healthy behaviors separately from other aspects of implementing IHAWP, which might include access to a wider range of providers and other factors.

Using two years of data post-implementation of the Medicaid expansion and Healthy Behaviors Program, we do not observe any association between the completion of healthy behaviors and medical or total Medicaid costs.

Given the limitations we discuss in the previous section, we urge caution in interpreting these findings. While our difference-in-difference models allow us to adjust for unobserved differences between the treatment and control groups, the method does have limitations in its ability to account for unobserved variation within the groups, and we were also forced to exclude a significant number of person-year observations to conduct these analyses, raising questions of generalizability. Finally, it is possible that insufficient time has transpired to see the effects of the HBI program on costs.