# Analytic Plan: ISP Utilization

## Project Details

### Lead Investigator/s

Mark Gritz, Perry Dickinson, Miriam Dickinson

### Project Team Members

Carter Sevick, Kim Wiggins

### Research Objective(s)

Do PCMPs that participated in ISP have a improved outcomes for attributed members compared to members atttributed to PCMPs that did not participate in ISP?

### Time Period

July 1 2015 – June 30 2022

### Patient, Practice Cohorts/Subjects

#### Inclusion Criteria

Health First Colorado Members ages 0 - 64 a/o 07/01/SFY (18/19, 19/20, 20/21, and 21/22), having:

* at least one month of eligibility for Health First Colorado
* not continuously enrolled in a physical health managed care plan, where
  + continuously: if all months =0, exclude
  + if combination: use only months =0
* attributed to a PCMP in any of SFYs

Claims Data for members identified above:

* Time Range: 07/01/2015 - 06/30/2022
* Claims data 07/01/2015 - 06/30/2018 to be used to develop risk adjustments for model
* Claims data 07/01/2018 - 06/30/2022 to be used in analysis

#### Exclusion Criteria

Dental

#### Study Sites

ISP vs non-ISP, based on pcmp\_loc\_id matching

## OUTCOMES, Measures, Metrics

Email from MG to ISP team Nov 2022:

Regarding outcomes, I am thinking our primary outcomes would be:

1. FFS total cost of care in month/quarter
2. Utilization of primary care services – need to decide if use count models for # of visits or logit model for probability of any use in month/quarter
3. Utilization of non-ED, non-hospital Capitated BH services - need to decide if use count models for # of encounters or logit model for probability of any use in month/quarter

For other analyses we are also measuring a variety of additional cost and utilization measures for a variety of reasons. These could easily be incorporated into our analytic file if we want some secondary measures.  I would appreciate your thoughts on which if any of these we would want. Note, we have separated out certain drugs for our foster care work and these are separated out below.

1. Utilization of emergency department services - need to decide if include both FFS and Capitated BH ED together or separately
2. Hospital Capitated BH services
3. FFS hospital services
4. FFS BH services
5. FFS Diagnostic Procedures
6. FFS Transportation
7. FFS HH Therapy
8. FFS Ancillary
9. FFS cost hospitalizations
10. FFS cost Primary care
11. FFS cost ER
12. FFS cost BH
13. FFS cost Ancillary
14. FFS cost HH Therapy
15. FFS cost Diagnostic Procedures
16. FFS cost Transportation
17. Pharmacy cost – need to decide if separate psychotropic and non-psychotropic costs
18. FFS cost Antidepressant
19. FFS cost Antipsychotic
20. FFS cost Stimulant
21. FFS cost Bipolar Drug
22. FFS cost Benzodiazapine
23. FFS Alpha\_2\_Agonist

### From Analysis Spec Document Sent Prior to above:

#### Context

Attribution to PCMPs / Trends in Monthly Attribution, as measured by:

1. Number of Unique Individuals attributed at any time in FY
2. Number of Unique Individuals attributed 6mo or more in FY
3. Number of Unique Individuals attributed 6mo or more in all FY’s

Member Characteristics

1. Number of months eligible for Health First Colorado
2. Number of months eligible and enrolled in a physical health managed care plan

#### HCPF Data Measure Outcomes

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Level** | **Outcome** | **Measure** | **Metric** | |
| **Primary** | **Cost** |  | **PMPM Total FFS cost of care (excluding Dental)** | |
| **Primary** | **Util** | **Behav Health** | **# of other encounters in a quarter** | |
| Secondary | Util | Primary care | # of PC visits in a quarter | |
| Secondary | Util | Primary care | # of Telehealth Services in a quarter | |
| Tertiary | Util | Primary care | # of STBH Services (CPT codes) in a quarter | |
| Tertiary | Util | Primary care | # of SBIRT Services (CPT codes) in a quarter | |
| Tertiary | Util | Primary care | Diagnosis codes of SBIRT Services (CPT codes) in a quarter | |
| Secondary | Cost | Primary care | PMPM cost of PC | |
| Secondary | Util | ED | Utilization of # of ED visits in a quarter | |
| Tertiary | Cost | ED | PMPM cost of ED services | |
| Tertiary | Util | Hospitalizations | Utilization # of hospital services in a quarter | |
| Tertiary | Cost | Hospitalizations | PMPM cost of hospitalizations | |
| Secondary | Cost | Pharmacy | PMPM cost of prescriptions | |
| Secondary | Utilization | Behav Health | # of Capitated ED visits in a quarter | |
| Tertiary | Utilization | Behav Health | # of capitated hospitalizations in a quarter | |

FILES

* Meeting Notes:
* Variable Lists:
  + isp\_util\_var\_list\_20230209.xlsx
    - Last discussion/ changes: 02/01/2023

## VARIABLES & DATA SOURCES

Meetings with Carter; various changes through 12/16 – landed on:

From analytic subset folder in HCPF, source datasets:

* Qry\_longitudinal (the dataset formerly known as Medicaidlong from bidm/bhjt)
* Qry\_demographics
* Qry\_bho\_

### MEMBERS

All Health First Colorado Members ages 0 – 64 as of June 30 of each SFY and had at least one month of eligibility for Health First Colorado, not continuously enrolled in a physical health managed care plan and attributed to a PCMP in any of SFYs 18/19, 19/20, 20/21 and 21/22

|  |  |  |  |
| --- | --- | --- | --- |
| **variable** | **source** | **varname** | **descr** |
| Health First Colorado Members | qry\_longitudinal  qry\_demographics | mcaid\_id |  |
| Age in years as of 6/30 of the respective SFY | qry\_demographics | brth\_dt | calculate / create new var |
| at least one month eligibility in HealthFirst CO | qry\_longitudinal | month > 1 | CS: if they are not in the util file, that just means they are not using. You will want to check with mark, but we usually take managedcare NE 1 and 1<=budget\_group<=15 |
| not continuously enrolled in a physical health managed care plan | qry\_longitudinal  / with relevant where statements / qry\_utilization file |  |  |
| attributed to a PCMP | qry\_longitudinal | pcmp\_loc\_id | ne ‘ ‘ |
|  |  |  |  |

Frequency, FY:

### MEMBER CHARACTERISTICS

1. Age in years as of 6/30 of the respective SFY
2. Sex
3. Race/ethnicity – use new HCPF race/ethnicity categories
4. County of residence
   * defined as county of residence for majority of months eligible for Health First Colorado
5. RCCO/RAE
   * will be determined from County of residence
6. Budget Group
   * use same rules as used to define budget group for tables in STBH\_table\_updated030622.xlsx
7. n months eligible for Health First Colorado
8. n months eligible and enrolled in a physical health managed care plan

(See var\_source\_plan\_CS.docx to see changes made)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **n** | **variable** | **source** | **varname** | **descr** | |
| 1 | Age in years as of 6/30 of the respective SFY | qry\_demographics | age | calculated above | |
| 2 | sex | qry\_demographics | gndr\_cd |  | |
| 3 | Race | qry\_demographics | race\_cd |  | |
| 4 | Ethnicity | qry\_demographics | ethnc\_cd |  | |
| 5 | County of Residence for majority of months eligible for Health First | qry\_longitudinal | enr\_county | calculate majority of months eligible (see row 8 – how?) and use that county | |
| 6 | RCCO/RAE |  | rae | =1 | |
| 6a | RAE\_id | rae | rae\_id, matched on  hcpf\_county\_code\_c; hcpf\_county\_code have 80?? | what is code 80?? |
| 7 | Budget Groups matching STBH tables | qry\_longitudinal | budgetgroup | in footnote[[1]](#footnote-2) | |
| 8 | n months eligible HFCO | qry\_longitudinal |  |  | |
|  | n months eligible and enrolled in a physical health managed care plan |  | hlth\_pgm\_cd |  | |
| 9 | attributed to an ISP practice / not | qry\_longitudinal.pcmp\_loc\_id, **redcap.dt\_prac\_isp** (reformatted dt\_prac\_start\_isp to date9. To match qry\_longitudinal, but they’re the same) | dt\_prac\_isp | time-varying covariate; flag starts the month the pcmp began ISP |

### OTHER COVARIATES

* PMCP Type
  + FQHC
  + RHC
  + Indian Health Service
  + School Based Health Center
  + Other
* ~~Risk determined by:~~ 
  + ~~Adults: Charleston Comorbidity Index (CCI) get from Carter #do~~
  + ~~Peds: PMCA (get from Jake #do)~~

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **n** | **variable** | **source** | **varname** | **descr** |
| 1 | PCMP Type | qry\_longitudinal | **pcmp\_type\_rc**  from original variable pcmp\_loc\_type\_cd | * original variable format prov\_typ\_cd frequency on raw qry\_longitudinal has 0 for School Health Services? (51)FQHC: 32, 61 * RHC: 45 * Other: remaining   was `prov\_typ\_cd` |

### QUESTION 1:

Do PCMPs that participated in ISP have a improved outcomes for attributed members compared to members attributed to PCMPs that did not participate in ISP?

* "members attributed to >1 clinic: attribute to clinic with most months
* in case of tie (n months), attribute to most recent

### Definite Outcomes:

1. FFS total cost of care in month/quarter
   * Excluding dental
2. Utilization of primary care services
   * need to decide if use count models for # of visits or logit model for probability of any use in month/quarter
3. Utilization of non-ED, non-hospital Capitated BH services
   * need to decide if use count models for # of encounters or logit model for probability of any use in month/quarter

|  |  |  |  |
| --- | --- | --- | --- |
| **variable** | **source** | **varname** | **descr** |
| FFS total cost of care in quarter | qry\_monthlyutilization | month | calculate quarters |
| Utilization of primary care services | qry\_monthlyutilization | clmClass | ? is this right? It’s by clmClass? |
| Utilization of non-ED, non-hospital Capitated BH services | qry\_monthlyutilization | clmClass | ? is this right? |
| Telecare / Telehealth |  |  |  |
| BHO |  |  |  |

### Potential Outcomes

*(will get / look at later – just focusing on Definite Outcomes, Covariates, and Members for now)*

1. Utilization of emergency department services
   1. need to decide if include both FFS and Capitated BH ED together or separately
2. Hospital Capitated BH services
3. FFS hospital services
4. FFS BH services
5. FFS Diagnostic Procedures
6. FFS Transportation
7. FFS HH Therapy
8. FFS Ancillary
9. FFS cost hospitalizations
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12. FFS cost BH
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14. FFS cost HH Therapy
15. FFS cost Diagnostic Procedures
16. FFS cost Transportation
17. Pharmacy cost
    1. need to decide if separate psychotropic and non-psychotropic costs
18. FFS cost Antidepressant
19. FFS cost Antipsychotic
20. FFS cost Stimulant
21. FFS cost Bipolar Drug
22. FFS cost Benzodiazapine
23. FFS Alpha\_2\_Agonist

## DATA ANALYSIS

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Preliminary tables/graphs for March presentation (all for ISP and non-ISP PCMPs):   * + - 1. **Attributed member trends – monthly 7/2019 - 6/2022**          1. Specs:   Per meeting 02/15: *all* attributed > not subset on budgetgroup etc.  Add plots for both q1 & q2  Generate list of ISP and non-ISP pcmp loc id’s > will need it for #3, #4  Data/ll\_fy1922\_pcmp\_isp [101]  Data/ll\_fy1922\_pcmp\_nonisp [955]   * 1. data\_tables/attr\_all\_pcmp   2. data\_tables/attr\_isp\_only      + 1. **Percentage change relative to 3/2020 – monthly 7/2019 – 6/2022[[2]](#footnote-3)**           1. data\_tables/attr\_rel\_march2020           2. data\_tables/attr\_rel\_march2020\_t        2. **# of PCMPs** delivering any telehealth services – monthly 7/2019 – 6/2022 (not member level – just pcmp-level for ISP/non-)[[3]](#footnote-4)           1. Specs:   If REND\_PROV\_LOC\_ID exists then use that; if not, then use BILLING\_PROV\_LOC\_ID  Only pcmps > compare to ISP, non-ISP pcmp list (generated in #1)  Copied pcmp into new column to count groups  Mtg notes: didn’t think there should be dates from prior to 03/2020, but they were definitely there); I excluded them to match the dates above for 2nd turn, however   * + - * 1. report: hcpf\_q3\_q4\_telehealth.xlsx       1. **Percentage of PCMPs** delivering any telehealth services – monthly 7/2019-6/2022          1. data\_tables/pct\_tele          2. data\_tables/pct\_tele\_t          3. data\_tables/n\_total\_isp          4. data\_tables/n\_total\_nonisp       2. Number of unique attributed members in calendar quarter – quarterly 3Q2019 – 2Q2022 (assign members to PCMP with the most months in a quarter and if there is an equal number assign to PCMP with attribution in last month eligible in the quarter)          1. data/       3. Utilization and cost summary measures – quarterly 3Q2019 – 2Q2022          1. PMPM Total FFS cost of care (excluding Dental)          2. Utilization - # of PMPM PC visits in a quarter          3. Utilization - # of PMPM PC Telehealth Services in a quarter          4. Utilization of non-ED, non-hospital Capitated BH services # of PMPM non-ED, non-hospital Capitated BH encounters in a quarter          5. Utilization of ED services (both FFS and Capitated) - # of PMPM ED visits in a quarter          6. PMPM Pharmaceutical cost  RESULTS isp\_utilization.sas code file  23-27: analysis0 > data.qrylong\_y15\_22 where 01JUL2019-30JUN2022  [40999955, 26 vars]  33-34: analysis1 > merge analysis0 and data/memlist by mcaid\_id, if a and b  [40999956, 28 vars]  36-49: analysis2 > join analysis1 with data/isp\_key  [40999956, 34 vars]   | **Month period of eligibility** | | | | | | --- | --- | --- | --- | --- | | **month** | **Frequency** | **Percent** | **Cumulative Frequency** | **Cumulative Percent** | | **01JUL2019** | 992498 | 2.42 | 992498 | 2.42 | | **01AUG2019** | 988816 | 2.41 | 1981314 | 4.83 | | **01SEP2019** | 983743 | 2.40 | 2965057 | 7.23 | | **01OCT2019** | 983002 | 2.40 | 3948059 | 9.63 | | **01NOV2019** | 984033 | 2.40 | 4932092 | 12.03 | | **01DEC2019** | 979415 | 2.39 | 5911507 | 14.42 | | **01JAN2020** | 976554 | 2.38 | 6888061 | 16.80 | | **01FEB2020** | 974334 | 2.38 | 7862395 | 19.18 | | **01MAR2020** | 966877 | 2.36 | 8829272 | 21.53 | | **01APR2020** | 996703 | 2.43 | 9825975 | 23.97 | | **01MAY2020** | 1017681 | 2.48 | 10843656 | 26.45 | | **01JUN2020** | 1047081 | 2.55 | 11890737 | 29.00 | | **01JUL2020** | 1059294 | 2.58 | 12950031 | 31.59 | | **01AUG2020** | 1076514 | 2.63 | 14026545 | 34.21 | | **01SEP2020** | 1093518 | 2.67 | 15120063 | 36.88 | | **01OCT2020** | 1113623 | 2.72 | 16233686 | 39.59 | | **01NOV2020** | 1128953 | 2.75 | 17362639 | 42.35 | | **01DEC2020** | 1148722 | 2.80 | 18511361 | 45.15 | | **01JAN2021** | 1164868 | 2.84 | 19676229 | 47.99 | | **01FEB2021** | 1177681 | 2.87 | 20853910 | 50.86 | | **01MAR2021** | 1189986 | 2.90 | 22043896 | 53.77 | | **01APR2021** | 1201298 | 2.93 | 23245194 | 56.70 | | **01MAY2021** | 1210549 | 2.95 | 24455743 | 59.65 | | **01JUN2021** | 1220159 | 2.98 | 25675902 | 62.62 | | **01JUL2021** | 1220819 | 2.98 | 26896721 | 65.60 | | **01AUG2021** | 1230812 | 3.00 | 28127533 | 68.60 | | **01SEP2021** | 1240603 | 3.03 | 29368136 | 71.63 | | **01OCT2021** | 1249794 | 3.05 | 30617930 | 74.68 | | **01NOV2021** | 1259665 | 3.07 | 31877595 | 77.75 | | **01DEC2021** | 1271015 | 3.10 | 33148610 | 80.85 | | **01JAN2022** | 1285103 | 3.13 | 34433713 | 83.98 | | **01FEB2022** | 1293823 | 3.16 | 35727536 | 87.14 | | **01MAR2022** | 1304666 | 3.18 | 37032202 | 90.32 | | **01APR2022** | 1313928 | 3.20 | 38346130 | 93.53 | | **01MAY2022** | 1322823 | 3.23 | 39668953 | 96.75 | | **01JUN2022** | 1331003 | 3.25 | 40999956 | 100.00 |   56-61: analysis3 > create **ind\_isp** (time-varying covariate) and **ind\_isp\_ever** (practice ever was a part of ISP, regardless of date).  [40999956 : 34 vars] Meeting Notes DRAFT:  Notes from meeting Sept – to be Updated with the other analyses notes:   * jacknife resampling technique at CLINIC level, use clinic as fixed effect; cluster at person level |
| * time unit: quarter |
| * mean-preserving top coding: 95th or 99th percentile (send both to MG) |
| * Risk adjustments: adults (18+), Charlson Comorbidity Index; peds, PMCA (Medical Complexity) |
| * : obtain one composite variable (low, medium, high complexity) |
| * : then interaction between composite variable \* adult / ped |

**Analyses to address study questions/hypotheses.**

Some text here will help with writing later on. This would be a good place to mention specific analyses (e.g. multivariate linear regression, etc) and highlight pros and cons or issues that need to be addressed

H1.

The primary outcome for this analysis is XXX. (see draft for examples)

H2.

H3.

Table 1:

Table 2:

Table 3:

Next steps, meetings, assignment of responsibilities, etc:

# APPENDIX

1. *BUDGET\_GROUP not in (****16****,****17****,****18****,****19****,****20****,****21****,****22****,****23****,****24****,****25****,****26****,****27****,-****1****,)* [↑](#footnote-ref-2)
2. HCPF…/Kim/isp/isp\_utilization/code/2023\_hcpf\_attr\_q1\_q2.sas [↑](#footnote-ref-3)
3. HCPF…/Kim/isp/isp\_utilization/code/202302\_hcpf\_tele\_q3\_q4.sas [↑](#footnote-ref-4)