

## Appendix 1 - Main characteristics of health plan types

Plan type	Patient incentive to use certain providers	Primary Care Physician (PCP) assigned	Referral from PCP to specialists required	Out of network services covered	Partially or fully capitated
Comprehensive	No	No	n/a	n/a	No
Health Maintenance Organization (HMO)	Yes	Yes	Yes	No	Yes
Point-of –Service (POS):	Yes	Yes	Yes	Yes	Varies
Preferred Provider Organization (PPO)	Yes	No	n/a	Yes	No
Consumer-Driven Health Plan (CDHP)	Varies	No	n/a	Varies	No
Exclusive Provider Organization (EPO)				No	
High Deductible Health Plan (HDHP)	Varies	No	n/a	Varies	No

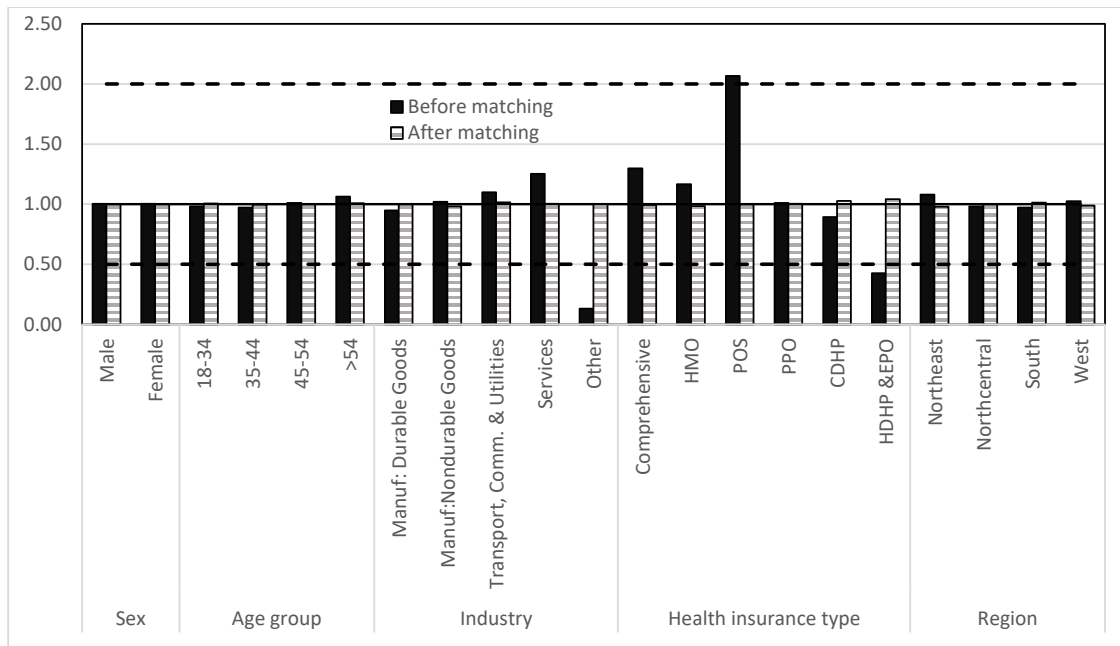
Source: MarketScan CCAE MDCR User Guide (2010), pp 19-20.

Appendix 2- ICD-9 and ICD-10 codes used to measure opioid abuse, dependence, and poisoning (diagnosed opioid-related morbidity)

	<b>ICD-9-CM Code</b>	<b>ICD-10-CM Code</b>
Opioid abuse	30550, 30551, 30552	F1110, F11120, F11121, 11122, F11129, F1114, F11150, F11151, F11159, F11181, F11182, F11188, F1119
Opioid dependence	30400, 30401, 30402, 30470, 30471, 30472	F1120, F11220, F11221, F11222, F11229, F1123, F1124, F11250, F11251, F11259, F11281, F11282, F11288, F1129
Adverse effects of opioids	E9350, E9351, E9352, E9401	T400X5A, T400X5D, T400X5S, T402X5A, T402X5D, T402X5S, T403X5A, T403X5D, T403X5S, T404X5A, T404X5D, T404X5S, T40605A, T40605D, T40605S, T40695A, T40695D, T40695S
Opioid poisoning	96500, 96501, 96502, 96509, 9701, E8500, E8501, E8502	T400X1A, T400X1D, T400X1S, T400X4A, T400X4D, T400X4S, T401X1A, T401X1D, T401X1S, T401X4A, T401X4D, T401X4S, T402X1A, T402X1D, T402X1S, T402X4A, T402X4D, T402X4S, T403X1A, T403X1D, T403X1S, T403X4A, T403X4D, T403X4S, T404X1A, T404X1D, T404X1S, T404X4A, T404X4D, T404X4S, T40601A, T40601D, T40601S, T40604A, T40604D, T40604S, T40691A, T40691D, T40691S, T40694A, T40694D, T40694S
Opioid use, unspecified		F1190, F11920, F11921, F11922, F11929, F1193, F1194, F11950, F11951, F11959, F11981, F11982, F11988, F1199

Source: HCUP, CASE STUDY: Exploring How Opioid-Related Diagnosis Codes Translate from Icd-9-Cm To Icd-10-Cm. APPENDIX A. ICD-9-CM and ICD-10-CM Opioid-related Diagnosis Codes Used in this Study. Available at: <https://www.hcup-us.ahrq.gov/datainnovations/ICD-10CaseStudyonOpioid-RelatedIPStays042417.pdf>

Appendix 3 -Variance-ratio test of covariate before and after matching



The bars are overlaid by lines equal to 0.5 and 2. Variance ratios are considered out of balance if the ratios are out of these lines.