

MRF Quality Report

s3://talon-storage-private/mrf-feed-uploads/
2025-10/2025-07-07_Providence_Health_Plan_d77ada66b9eac0e546b2d25c7de55a25_in-network-rates.json.gz
Size: 4.05 GB • MD5: fea6226c0db944618a7eb1ea190ad091

Payer: **Providence_Health_Plan** • File Date: **2025-07-07** • Generated: **2026-04-25 21:51 EDT** • Tool Version: **1.0.0** • Elapsed: **10817.80s**

65.0

Limited Reliability

score capped at 65.0 — CMS official schema validation failed (see meta for details)

Errors: 3 • Warnings: 12 • Info: 3

TOC Plan References

TOC: s3://talon-storage-private/mrf-feed-uploads/2025-10/2025-10-15_Providence-Health-Plan-Master_combine_index.json • Providence Health Plan (Health Plan)

Canonical: s3://talon-storage-private/mrf-feed-uploads/2025-10/2025-07-07_Providence_Health_Plan_d77ada66b9eac0e546b2d25c7de55a25_in-network-rates.json.gz

Plan Name	Plan ID	Issuer / Sponsor	Market
CONNECT	56707OR1160034-01 (HIOS)	—	group
CONNECT	481270920 (EIN)	—	group
CONNECT	930801200 (EIN)	—	group
CONNECT	930645303 (EIN)	—	group
CONNECT	930631398 (EIN)	—	group
CONNECT	911802282 (EIN)	—	group
CONNECT	931323384 (EIN)	—	group
CONNECT	931231753 (EIN)	—	group
CONNECT	56707OR1160026-00 (HIOS)	—	group
CONNECT	56707OR1160030-01 (HIOS)	—	group
CONNECT	853641027 (EIN)	—	group

Plan Name	Plan ID	Issuer / Sponsor	Market
CONNECT	814482368 (EIN)	—	group
CONNECT	510430615 (EIN)	—	group
CONNECT	911850998 (EIN)	—	group
HSA_CONNECT	453729983 (EIN)	—	group
CONNECT	270464840 (EIN)	—	group
CONNECT	900463816 (EIN)	—	group
CONNECT	56707OR1160025-00 (HIOS)	—	group
CONNECT	251059306 (EIN)	—	group
CONNECT	473934102 (EIN)	—	group
CONNECT	261799439 (EIN)	—	group
CONNECT	930461940 (EIN)	—	group
CONNECT	854076340 (EIN)	—	group
CONNECT	721546821 (EIN)	—	group
CONNECT	56707OR1140024-01 (HIOS)	—	group
CONNECT	931253211 (EIN)	—	group
CONNECT	931082420 (EIN)	—	group
CONNECT	56707OR1160033-00 (HIOS)	—	group
HSA_CONNECT	930915902 (EIN)	—	group
HSA_CONNECT	930741343 (EIN)	—	group
HSA_CONNECT	912072514 (EIN)	—	group
CONNECT	204366910 (EIN)	—	group
CONNECT	454436269 (EIN)	—	group
CONNECT	930625359 (EIN)	—	group
CONNECT	930401259 (EIN)	—	group
CONNECT	821922730 (EIN)	—	group
CONNECT	462847887 (EIN)	—	group
HSA_CONNECT	930796258 (EIN)	—	group
HSAE_CONNECT	931259453 (EIN)	—	group
CONNECT	205230500 (EIN)	—	group

Plan Name	Plan ID	Issuer / Sponsor	Market
CONNECT	205183622 (EIN)	—	group
CONNECT	273524752 (EIN)	—	group
CONNECT	260037160 (EIN)	—	group
CONNECT	832822118 (EIN)	—	group
CONNECT	931255402 (EIN)	—	group
CONNECT	930951908 (EIN)	—	group
CONNECT	930875022 (EIN)	—	group
CONNECT	56707OR1160034-00 (HIOS)	—	group
CONNECT	472868904 (EIN)	—	group
CONNECT	320621012 (EIN)	—	group
CONNECT	262178504 (EIN)	—	group
CONNECT	931286637 (EIN)	—	group
CONNECT	56707OR1160032-00 (HIOS)	—	group
CONNECT	201321142 (EIN)	—	group
CONNECT	930740972 (EIN)	—	group
CONNECT	421615132 (EIN)	—	group
CONNECT	930727680 (EIN)	—	group
CONNECT	930502772 (EIN)	—	group
CONNECT	930391604 (EIN)	—	group
CONNECT	930386839 (EIN)	—	group
CONNECT	930139540 (EIN)	—	group
CONNECT	870983161 (EIN)	—	group
CONNECT	931039178 (EIN)	—	group
CONNECT	56707OR1160028-01 (HIOS)	—	group
CONNECT	930841378 (EIN)	—	group
CONNECT	471325098 (EIN)	—	group
CONNECT	931186516 (EIN)	—	group
HSA_CONNECT	205230500 (EIN)	—	group
CONNECT	471016155 (EIN)	—	group

Plan Name	Plan ID	Issuer / Sponsor	Market
CONNECT	454643988 (EIN)	—	group
CONNECT	453960543 (EIN)	—	group
CONNECT	352511095 (EIN)	—	group
CONNECT	930498305 (EIN)	—	group
CONNECT	821778909 (EIN)	—	group
CONNECT	931315454 (EIN)	—	group
CONNECT	454237502 (EIN)	—	group
CONNECT	271907506 (EIN)	—	group
CONNECT	261417982 (EIN)	—	group
CONNECT	930664280 (EIN)	—	group
CONNECT	930630573 (EIN)	—	group
CONNECT	930479869 (EIN)	—	group
CONNECT	931159177 (EIN)	—	group
CONNECT	930817267 (EIN)	—	group
CONNECT	56707OR1160032-01 (HIOS)	—	group
CONNECT	300831016 (EIN)	—	group
CONNECT	462348605 (EIN)	—	group
CONNECT	710951543 (EIN)	—	group
HSA_CONNECT	930809066 (EIN)	—	group
CONNECT	930717810 (EIN)	—	group
CONNECT	834309781 (EIN)	—	group
CONNECT	930825821 (EIN)	—	group
CONNECT	56707OR1160033-01 (HIOS)	—	group
CONNECT	930606729 (EIN)	—	group
CONNECT	930514420 (EIN)	—	group
CONNECT	832373106 (EIN)	—	group
CONNECT	931259453 (EIN)	—	group
CONNECT	56707OR1160025-01 (HIOS)	—	group
CONNECT	56707OR1160030-00 (HIOS)	—	group

Plan Name	Plan ID	Issuer / Sponsor	Market
CONNECT	843008770 (EIN)	—	group
CONNECT	832004498 (EIN)	—	group
CONNECT	931229441 (EIN)	—	group
CONNECT	931142052 (EIN)	—	group
CONNECT	274633819 (EIN)	—	group
CONNECT	201288530 (EIN)	—	group
CONNECT	201068748 (EIN)	—	group
CONNECT	260025467 (EIN)	—	group
CONNECT	930232310 (EIN)	—	group
CONNECT	911833480 (EIN)	—	group
CONNECT	743101207 (EIN)	—	group
CONNECT	931160845 (EIN)	—	group
CONNECT	930960920 (EIN)	—	group
CONNECT	56707OR1160026-01 (HIOS)	—	group
CONNECT	931111589 (EIN)	—	group
CONNECT	461475038 (EIN)	—	group
CONNECT	202731305 (EIN)	—	group
CONNECT	473264062 (EIN)	—	group
CONNECT	912072514 (EIN)	—	group
CONNECT	873811584 (EIN)	—	group
CONNECT	862010026 (EIN)	—	group
CONNECT	931218471 (EIN)	—	group
CONNECT	931122025 (EIN)	—	group
CONNECT	931099284 (EIN)	—	group
CONNECT	56707OR1160028-00 (HIOS)	—	group
CONNECT	201316346 (EIN)	—	group
CONNECT	200073626 (EIN)	—	group
CONNECT	930655509 (EIN)	—	group
CONNECT	930451960 (EIN)	—	group

Plan Name	Plan ID	Issuer / Sponsor	Market
CONNECT	930242363 (EIN)	—	group
CONNECT	911844464 (EIN)	—	group
CONNECT	711005562 (EIN)	—	group
CONNECT	930960969 (EIN)	—	group
CONNECT	930820202 (EIN)	—	group
CONNECT	930516558 (EIN)	—	group
CONNECT	390552328 (EIN)	—	group
CONNECT	930599056 (EIN)	—	group
CONNECT	911757312 (EIN)	—	group
CONNECT	931236647 (EIN)	—	group
CONNECT	931156786 (EIN)	—	group

CMS Official Schema Validation

FAILED (exit code -1) — File does not conform to the CMS schema.

Validator output:

Timed out after 600 s

Dimension Scores

Dimension	Score	Weight	Findings
Schema Integrity	70.0	30%	4
Provider Mapping	99.9	15%	3
Code Coverage	88.5	15%	2
Pricing Sanity	63.2	40%	9

Schema Integrity — Findings

Score: 70.0

ERROR `file_freshness`

File is 292 days old (last_updated_on exceeds the 90-day threshold)

WARNING `item_required_fields`

0.01% of in_network items are missing required fields

WARNING `expired_prices`

19546927 negotiated_prices have past expiration dates (6.5%)

ERROR `cms_schema_validation`

CMS official schema validator FAILED (exit code -1). File does not conform to the TIC in-network-rates schema.

Provider Mapping — Findings

Score: 99.9

WARNING ein_validity

0.56% of EINs failed IRS prefix validation (189 of 33663)

- 000000001
- 001625898
- 003360711
- 003680161
- 004829723
- ... and 5 more

WARNING empty_npi_groups

36 provider groups contain no NPIs

INFO duplicate_npis

17036 NPIs appear in more than one provider group

Code Coverage — Findings

Score: 88.5

WARNING unknown_billing_code_types

Unrecognized billing_code_type values: {'PROC': 1}

WARNING billing_code_format

3924 CPT codes do not match expected format

Pricing Sanity — Findings

Score: 63.2

INFO `per_diem_rates`

11596 per-diem rates (0.0%) — not dollar amounts; excluded from spread analysis

INFO `percentage_rates`

216688 percentage rates (0.1%) — values represent % of a reference rate, not dollar amounts; excluded from spread analysis

ERROR `zero_rates`

3398 zero-dollar rates (0.00%) — CMS schema requires `negotiated_rate > 0` (`exclusiveMinimum`)

WARNING `extreme_rates`

1.21% of rates are extreme (3619208 above class-specific high threshold, 0 below \$0.01)

WARNING `high_frequency_rate_value`

1 rate value(s) appear with suspiciously high frequency ($\geq 0.5\%$ of dollar rates and ≥ 50 occurrences) — likely placeholder/sentinel values rather than real negotiated rates.

- `{'rate': 2250000.0, 'count': 2206010, 'pct': 0.74}`

WARNING `rate_spread_by_class`

`billing_class='professional' / negotiated_type='fee schedule':` P95/P50 spread is 6.9x (threshold: 5x, N=290,387,994 (1,000 sampled), high confidence)

WARNING `rate_spread_by_class`

`billing_class='professional' / negotiated_type='negotiated':` P95/P50 spread is 1569.0x (threshold: 5x, N=79,997 (1,000 sampled), high confidence)

WARNING `rate_spread_by_class`

`billing_class='institutional' / negotiated_type='negotiated':` P95/P50 spread is 166.2x (threshold: 10x, N=14,093 (1,000 sampled), high confidence)

WARNING `per_code_rate_spread`

6345 rate contexts have a max/min ratio exceeding the type-specific threshold (20x professional / 50x facility, min 3 occurrences required). Each context is a unique combination of all 10 rate-key dimensions. n= shows how many distinct provider rates exist for that exact context.

Code	Code Type	Neg. Type	Billing Class	Arrangement	Setting	Min	Median	Mean	Max	Ratio	n
J3425	HCPCS	negotiated	institutional	ffs	—	\$0.02	\$1200000.00	\$825000.01	\$1275000.00	63750000.0x	3
Q4125	HCPCS	negotiated	institutional	ffs	—	\$0.02	\$1200000.00	\$825000.01	\$1275000.00	63750000.0x	3
J2003	HCPCS	negotiated	institutional	ffs	—	\$0.02	\$1200000.00	\$825000.01	\$1275000.00	63750000.0x	3
Q0162	HCPCS	negotiated	institutional	ffs	—	\$0.02	\$1200000.00	\$825000.01	\$1275000.00	63750000.0x	3
J0665	HCPCS	negotiated	institutional	ffs	—	\$0.02	\$1200000.00	\$825000.01	\$1275000.00	63750000.0x	3
J2004	HCPCS	negotiated	institutional	ffs	—	\$0.02	\$1200000.00	\$825000.01	\$1275000.00	63750000.0x	3
J0615	HCPCS	negotiated	institutional	ffs	—	\$0.02	\$1200000.00	\$825000.01	\$1275000.00	63750000.0x	3
Q0174	HCPCS	negotiated	institutional	ffs	—	\$0.02	\$1200000.00	\$825000.01	\$1275000.00	63750000.0x	3
Q0174	HCPCS	negotiated	institutional	ffs	—	\$0.02	\$1200000.00	\$825000.01	\$1275000.00	63750000.0x	3
Q0173	HCPCS	negotiated	institutional	ffs	—	\$0.02	\$1200000.00	\$825000.01	\$1275000.00	63750000.0x	3

Recommended Actions

1. **schema** `file_freshness`

P1

File is 292 days old (`last_updated_on` exceeds the 90-day threshold)

2. **schema** `cms_schema_validation`

P1

CMS official schema validator FAILED (exit code -1). File does not conform to the TIC in-network-rates schema.

3. **pricing** `zero_rates`

P1

3398 zero-dollar rates (0.00%) — CMS schema requires `negotiated_rate > 0` (`exclusiveMinimum`)

4. **provider_mapping** `ein_validity`

P2

0.56% of EINs failed IRS prefix validation (189 of 33663)

5. **provider_mapping** `empty_npi_groups`

P2

36 provider groups contain no NPIs

6. **pricing** extreme_rates

P2

1.21% of rates are extreme (3619208 above class-specific high threshold, 0 below \$0.01)

7. **pricing** high_frequency_rate_value

P2

1 rate value(s) appear with suspiciously high frequency ($\geq 0.5\%$ of dollar rates and ≥ 50 occurrences) — likely placeholder/sentinel values rather than real negotiated rates.

8. **pricing** rate_spread_by_class

P2

billing_class='professional' / negotiated_type='fee schedule': P95/P50 spread is 6.9x (threshold: 5x, N=290,387,994 (1,000 sampled), high confidence)

9. **pricing** rate_spread_by_class

P2

billing_class='professional' / negotiated_type='negotiated': P95/P50 spread is 1569.0x (threshold: 5x, N=79,997 (1,000 sampled), high confidence)

10. **pricing** rate_spread_by_class

P2

billing_class='institutional' / negotiated_type='negotiated': P95/P50 spread is 166.2x (threshold: 10x, N=14,093 (1,000 sampled), high confidence)

11. **pricing** per_code_rate_spread

P2

6345 rate contexts have a max/min ratio exceeding the type-specific threshold (20x professional / 50x facility, min 3 occurrences required). Each context is a unique combination of all 10 rate-key dimensions. n= shows how many distinct provider rates exist for that exact context.

12. **schema** item_required_fields

P2

0.01% of in_network items are missing required fields

13. **schema** expired_prices

P2

19546927 negotiated_prices have past expiration dates (6.5%)

14. **code_coverage** unknown_billing_code_types

P3

Unrecognized billing_code_type values: {'PROC': 1}

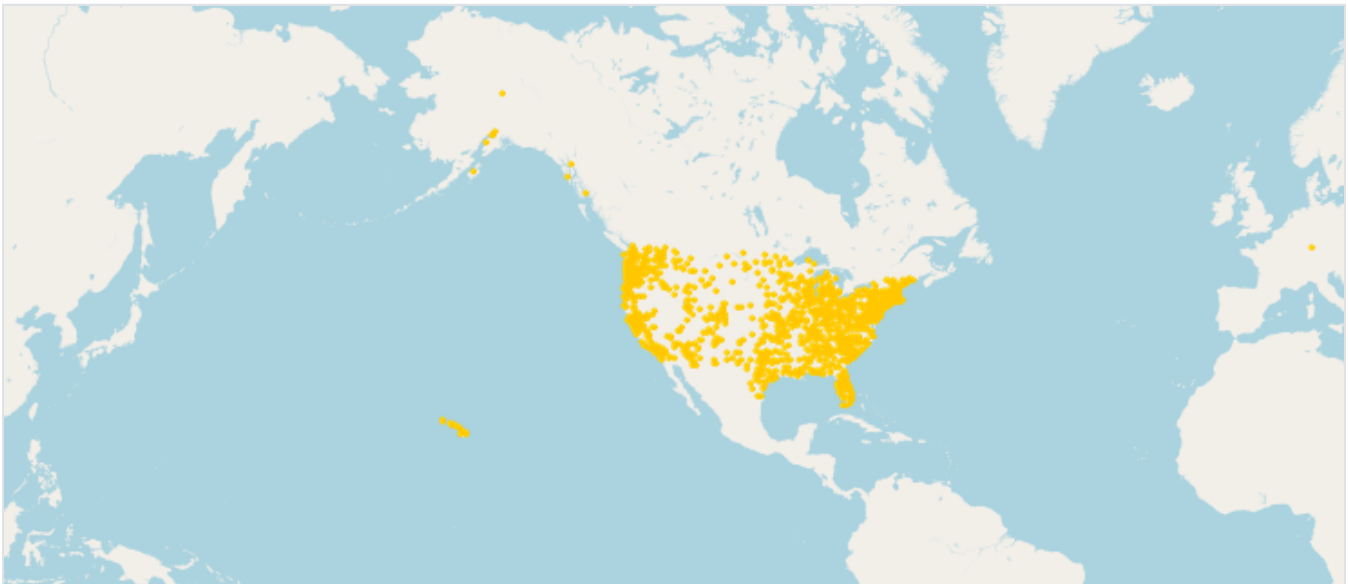
15. **code_coverage** billing_code_format

P3

3924 CPT codes do not match expected format

Provider Geographic Coverage

22254 unique NPIs found — 22114 geocoded (99%) — 4117 zip codes represented.



Schema Integrity — Metrics

header_missing_fields	
header_conditional_issues	
file_age_days	292
items_total	26226
items_missing_required_pct	0.008
items_empty_rates	0
prices_total	300141097
prices_missing_required_pct	0.0

prices_missing_field_breakdown		
prices_missing_service_code		0
prices_invalid_billing_class		0
rates_without_providers		0
negotiation_arrangements	ffs	26094
	capitation	132
billing_code_types	HCPCS	7824
	CPT	15232
	RC	565
	MS-DRG	788
	APC	877
	CDT	939
	PROC	1
expired_prices		19546927
invalid_expiration_format		0

Provider Mapping — Metrics

provider_references_in_file		21469
provider_group_ids_referenced		19123
unresolved_references		0
resolution_rate_pct		100.0
npis_validated		54475
invalid_npi_count		0
npi_validity_rate_pct		100.0
invalid_npi_examples		
eins_validated		33663
invalid_ein_count		189
ein_validity_rate_pct		99.44
invalid_ein_examples		000000001, 000000001, 000000001, 001625898, 001625898, 001625898, 003360711, 003360711, 003360711, 003680161
empty_npi_groups		36

groups_without_tin	0
npis_in_multiple_groups	17036

Code Coverage — Metrics

unique_codes_total	26094	
duplicate_codes	132	
duplicate_pct	0.51	
by_code_type	HCPCS	7812
	CPT	15112
	RC	565
	MS-DRG	788
	APC	877
	CDT	939
	PROC	1
unknown_code_types	PROC	1
format_invalid_by_type	CPT	3924
codes_not_in_reference	reference_not_loaded	

most_frequent_codes	Type	Code	Occurrences
	HCPCS	G0439	2
	CPT	99382	2
	CPT	17004	2
	CPT	99392	2
	CPT	99285	2
	CPT	99387	2
	CPT	99397	2
	CPT	98968	2
	HCPCS	G0296	2
	CPT	96375	2
	CPT	99411	2
	CPT	99393	2
	CPT	98966	2
	CPT	99422	2
	HCPCS	G2010	2
	CPT	36415	2
	CPT	99404	2
	CPT	99496	2
	CPT	16000	2
	CPT	98967	2

Pricing Sanity — Metrics

total_prices_checked	300141097
total_rates	299912813
per_diem_rates	11596
percentage_rates	216688
negative_rates	0
zero_rates	3398
extreme_high_rates	3619208
extreme_low_rates	0

rate_distribution	sample_n	299912813
	sample_k	5000
	confidence	high
	p5	27.0855
	p25	174.395
	p50	640.66000000000001
	p75	1552.93
	p95	4106.322
	p99	2250000.0

by_billing_class	Class / Type	Count	Median	p25	p75	p95	Confidence
	professional/ fee schedule	290,387,994	574.4	189.6	1501.7	3971.1	high
	institutional/ fee schedule	9,430,729	599.8	119.7	1825.6	4561.2	high
	professional/ negotiated	79,997	1434.0	573.6	2250000.0	2250000.0	high
	institutional/ negotiated	14,093	7670.8	49.3	1200000.0	1275000.0	high

negotiated_types	fee schedule	299818723
	negotiated	94090

unique_rate_contexts	47789
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rate_key_dimension_validity	invalid_negotiated_type	0
	invalid_negotiated_types_seen	{}
	invalid_setting	0
	invalid_settings_seen	{}
	invalid_severity_of_illness	0
	severity_on_non_apr_drg	0
	institutional_with_service_codes	0
	invalid_service_code_format	0
	billing_code_modifier_too_long	0

Scoring Methodology

Embedded in this report at generation time.

Overall Score

Weighted sum of four structural dimensions, normalized to a 0–100 scale.

Normalized Weights		
	Schema Integrity	30%
	Provider Mapping	15%
	Code Coverage	15%
	Pricing Sanity	40%

Confidence Bands		
	High	≥90
	Usable With Caution	≥75
	Limited Reliability	≥60
	Not Usable	<60

Score Caps		
	Raw Json Errors Only → 74.0	Native JSON syntax errors in the unpatched source file. File must be re-exported by the payer; scoring reflects auto-patched data only.
	Cms Validation Failure Only → 65.0	CMS official schema validator reports the file does not conform to the TIC spec.
	Both Raw Json Errors And Cms Failure → 59.0	Both native JSON syntax errors and CMS schema validation failure present.

Rate Context Key — 14-Tuple Field Coverage

Every rate in a CMS TIC MRF file is described by a 14-field tuple. Fields 1–10 form the rate-context key used to group and compare rates across the system. Fields 11–12 (provider, expiration date) are validated separately and excluded from the grouping key for analytical reasons. Each of the four scoring dimensions validates a distinct slice of this tuple — together they cover all 14 fields.

Field	Validated by
1 billing_code_type	Schema (required field) + Code Coverage (enum + format validation)
2 billing_code_type_version	Schema (required field)
3 billing_code	Schema (required field) + Code Coverage (format, duplicates, reference lookup)
4 billing_code_modifier	Pricing (modifier length, key normalization)
5 service_code	Pricing (POS format, normalization, institutional-class check)
6 negotiated_type	Pricing (CMS TIC enum validation)
7 billing_class	Schema (CMS TIC enum validation) + Pricing (spread thresholds)
8 negotiation_arrangement	Schema (CMS TIC enum validation) + Pricing (FFS vs bundle/capitation gating)
9 severity_of_illness	Pricing (APR-DRG only, valid values 1–4)

Field	Validated by
10 setting	Pricing (CMS TIC enum validation)
11 provider (NPI/EIN)	Provider Mapping (Luhn checksum, IRS prefix, group resolution) — excluded from grouping key
12 expiration_date	Schema (date validity, far-future sanity) — excluded from grouping key
13 additional_generic_notes	not validated (free-text)
14 negotiated_rate	Pricing (negative/zero/extreme-value checks, spread analysis)

- Fields 1–10 are the grouping key. Each unique combination is a distinct rate context — rates with different modifiers, POS codes, or arrangements land in separate buckets and are never compared against each other.
- Provider (field 11) is excluded from the key: the spread check is cross-provider by design. Partitioning by provider produces singleton buckets and eliminates the spread signal.
- Expiration date (field 12) is excluded because it is a contract lifecycle attribute, not a clinical context. Rates for the same service should be comparable regardless of when they expire.
- service_code (field 5) arrays are flattened and normalized before keying: '1' → '01', and a rate with ['11','22'] contributes to both the '11' and '22' buckets so rates are compared apples-to-apples by place of service.

Schema Integrity

Validates required fields, enum values, conditional requirements, and date validity per the CMS TIC in-network-rates schema. Also checks file freshness and expiration date sanity.

Method: Penalty-based deductions from 100, capped per category.

per_missing_required_header_field	5
per_header_conditional_issue	2
freshness_warn	5
freshness_error	10
item_missing_fields_pct	×5 (cap 30)
empty_rates_pct	×0.5 (cap 5)
price_missing_fields_pct	×10 (cap 30)
rates_without_providers_rate	×200 (cap 20)
expired_prices_pct	×0.5 (cap 5)
file freshness warn days	45
file freshness error days	90
expiry far future years	3

Provider Mapping

Verifies that all provider_group_id references in in_network items resolve to an entry in the provider_references array. Validates NPI integrity via Luhn checksum and EIN integrity via IRS-issued 2-digit prefix.

Method: Weighted component sum (not purely penalty-based).

provider_resolution (60%)	$\text{resolution_rate\%} \times 0.60$
npi_validity (30%)	$(100 - \text{invalid_npi_pct} \times 5) \times 0.30$
ein_validity (10%)	$10 - (\text{invalid_ein_pct} \times 0.1)$ [0% invalid → 10 pts, 100% invalid → 0 pts, linear]

Code Coverage

Tracks every (billing_code_type, billing_code) pair and flags unrecognized CMS TIC code types, format violations for CPT/HCCPS/NDC, and duplicates (same code appearing in multiple in_network items).

Method: Penalty-based deductions from 100.

per_unknown_code_type	3 pts each (cap 20)
format_invalid_pct	$\times 0.5$ (cap 10)
duplicate_code_pct	$\times 2$ (cap 20)
codes_not_in_reference_pct	$\times 0.5$ (cap 30) — only when reference set is loaded

Pricing Sanity

Detects invalid rates (negative, zero, extreme-value) and distribution anomalies (per-class P95/P50 spread, per-code max/min ratio, flat-rate distributions). Exact counts are used for all validity checks (negative, zero, extreme, dimension validity). Percentile-based checks (spread, IQR) use reservoir sampling — $k=5\,000$ global, $k=1\,000$ per (billing_class, negotiated_type) bucket — so memory stays bounded on large files. Per-code max/min spread is exact (all rates seen, no sampling).

Method: Penalty-based deductions from 100.

negative_rate_pct	$\times 5$ (cap 20)
zero_rate_pct	$\times 3$ (cap 15)
extreme_rate_pct	$\times 5$ (cap 25) — ffs only
class_spread_excess	$(\text{spread} - \text{threshold}) \times 2$, max across (billing_class, negotiated_type) buckets (cap 15)
per_code_high_spread_count	$\times 0.1$ (cap 15)
invalid_negotiated_type_pct	$\times 3$ (cap 10) — rates silently dropped
invalid_setting_pct	$\times 1$ (cap 5) — silently defaults to wildcard
invalid_severity_pct	$\times 1$ (cap 5) — silently normalised to ''
institutional_with_service_codes_pct	$\times 1$ (cap 5) — extra key variation
invalid_service_code_pct	$\times 2$ (cap 5) — encode raises ValueError
extreme high by billing class	professional: 25000.0, institutional: 2000000.0, both: 2000000.0, default: 500000.0

extreme low	0.01
spread warn p95 over p50 by class	professional: 5, institutional: 10, both: 10, default: 5
per rate context max min ratio	professional_codes: 20, facility_drg_codes: 50
flat rate iqr p75 threshold pct	5.0
flat rate min rates to check	100
spread min n to flag	50
per code min n to flag	3

Dashboard: MRF Identity Key

(ingest-time — not stored in report JSON)

The dashboard assigns a persistent `mrf_key` to each MRF so that all validation runs of the same file are grouped together in the score-history view, even if the payer re-exports the file at a new URL.

Tier 1 — entity + plan_id	Used when both <code>reporting_entity_name</code> and <code>plan_id</code> are present. Key input: <code>plan <entity> <plan_id_type> <plan_id></code> . Stable across monthly re-exports.
Tier 2 — URL hash	Fallback when <code>plan_id</code> is absent. Key input: the raw file location URL/path. Entity name alone is not used — a payer publishes multiple distinct plans under the same entity name and without <code>plan_id</code> they cannot be safely distinguished. A URL change produces a different key.

The key is a 16-character MD5 hex digest of the input string (case-insensitive, whitespace-stripped). **This run:** `mrf_key = 9c48fb765b7e3d5a · entity = Providence_Health_Plan · tier = 2 (URL hash)`

Provider Geographic Coverage

(supplemental — does not affect score)

Geographic analysis is a supplemental feature computed on demand after scoring completes. It does not affect any scoring dimension — it is an observational overlay to assess the breadth and distribution of in-network providers.

NPPES	CMS National Plan and Provider Enumeration System — monthly full-replacement CSV. Maps each NPI to its primary registered ZIP code.
ZCTA centroids	GeoNames US postal code file. Maps each 5-digit ZIP to a (latitude, longitude) centroid for map placement.

Process: Extract all NPIs from the MRF file → resolve each NPI to its primary practice ZIP via NPPES → aggregate provider count per ZIP → map each ZIP to a lat/lon centroid via ZCTA → render as a weighted heatmap (intensity \propto provider count per ZIP).

Limitations: NPIs absent from NPPES (recently issued, test NPIs, EINs) are excluded and reduce the geocoding match rate. Location reflects the provider's NPPES-registered primary address, not necessarily where they accept this specific plan. Map viewport covers the bounding box of ZIP codes representing 90% of total provider count, dropping sparse geographic outliers.