

Proposed QHP/MA Provider Network Directory Schema

DON'T EDIT THIS DOCUMENT

This document was used provide input from industry to CMS/CCIIO by 7/27/2015 for use with the rule on machine-readable QHP provider network directories.

EDIT THE DOC FOR SCHEMA.ORG

All future comments and edits should be posted in the working doc for the related [Schema.org managed extension](#)

[Purpose](#)

[Starting Point](#)

[Considerations](#)

[Launch related Schema.org](#)

[Proposed Schema](#)

[Health Plans - plans.json](#)

[Benefits sub-type](#)

[Providers - providers.json](#)

[Drugs - drugs.json](#)

[Points of Consensus](#)

[Schema Hierarchy Analysis](#)

[Fields defined by CMS](#)

[Relationships & cardinality](#)

[Lowest level of granularity](#)

[Proposed changes to existing JSON](#)

File governance: Please be sure you're signed in with Google when providing comments and edits, so that we know who to follow up with on clarifications.

Purpose

The goal for this document is to reach general consensus among industry participants (via the Provider Directory Workgroup (PDWG)) to implementing the [CMS's 45 C.F.R.](#)

[156.230\(b\) requirement for QHP's on FFM's to provide monthly machine-readable provider network directories](#), due for open enrollment 2015. In the context of this document, industry participants are those who have been participating in discussions as part of the PDWG (provider directory workgroup) starting 6/1/2015, as organized by Aneesh Chopra and David Portnoy.

The schema here is a candidate for adoption by **Schema.org** with assistance from Google's participants in PDWG. It's acknowledged that the schema can be used either as machine-only **JSON** files and APIs or as HTML web pages with embedded **Microdata**. Those who choose to implement the later could benefit from search engines being able to structurally interpret and index their websites.

Starting Point

The original source for this document is [CMSgov/QHP-provider-formulary-APIs on Github](#). The reason I propose starting here is that CMS has proposed this schema as a [starting point since 3/30/2015](#) and has been requesting public comment on it. (Note: A [separate starting point](#) has been proposed, but I'm not sure if it's based on any existing standards.)

CMS-10558

Information Collection for Machine Readable Data for Provider Network and Prescription Formulary Content for FFM QHPs
http://www.regulations.gov/#!documentDetail;D=CMS_FRDOC_0001-1669

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- **Status:**Posted
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- **Comment Start Date:**Mar 30, 2015
- **Comment Due Date:**May 29, 2015

Public comments have been posted starting 5/29/2015 [here](#)
(Responses from CMS due 6/29/2015)

Considerations

1. Proposed **JSON vs Schema.org**: Schema.org is not mutually exclusive of the JSON schema listed on Github. The schema ultimately published on Schema.org *can be* structurally identical to the JSON schema.
 - a. The only difference is that publishing on Schema.org adds the ability for web crawlers to interpret the schema for **search engines** when it's published as HTML + Microformat.
 - b. The consensus on a schema is not a one-time event. The schema will almost certainly **evolve** over time to accommodate changes in regulations and industry practices. As a matter of fact, the schema **version number** is incorporated in the specification.
2. **The process**: Google will publish a schema on schema.org as soon as it gets input from workgroup members.
 - a. **Next step**: I'll set up a Google doc with the proposed schema for everyone to comment on by EOD Friday 6/26. Please provide your insights and needs for incorporation into the schema.
 - i. Note that not all fields specified in the schema will be required, which should lower the number of objections, making it easier to reach a general consensus.
 - b. **Timing and participation**: Once Google publishes the schema members of PDWG and industry are free to adopt it at any time in the future. They don't explicitly need to declare their support. They can simply reference the schema in the Microdata incorporated into their websites.
 - i. While publishing web pages to the official schema is optional, doing so has the advantage of being correctly interpreted and indexed by search engines.
3. In a decentralized, federated model, trust could be granted by **whitelisting** URLs of payers, providers and 3rd party services. The exact method of implementing the white list still needs to be decided. Perhaps submitting via HIOS and publishing as an API service on a CMS-owned website.
 - a. There might also be challenges in how to **reconcile** cases where multiple sources show conflicting information.
 - b. We also need to ensure that the information taken in aggregate is **complete**.
4. **Multiple origins of data**: It has been pointed out that some of the data is better sourced from providers, while other is better sourced from issuers. This potential split should be considered when deciding on optimal schema implementation. For example:

- a. Physicians better know: Medical groups they belong to, locations, hours, specialties, certifications
- b. Payers better know: Networks (PPO, FMM), tiers, deductibles

Launch related Schema.org

Google's Schema.org team is working on establishing a related **managed extension** for provider network directories. The working document can be found [here](#). The starting point is the schema mandated by CMS as the **base**. It is **supplemented** by fields that are desired by industry participants (providers, payers, intermediaries and consumers) to be

1. More representative of real-world scenarios
2. More accurate
3. More up to date

As part of this process, we also need to consider existing adjacent schemas for MedicalOrganization and Drug. We may need to coordinate with the groups who manage these schemas.

- <http://schema.org/MedicalOrganization>
- <http://schema.org/Drug>

Proposed Schema

(Credit for initial schema should be given to Greg Gershman and Ryan P)

JSON

All information must be described in the JSON file format. JSON is a lightweight and simple way to represent machine-readable data. It is quickly becoming the de facto standard for shuttling data across the internet, fueled primarily by the rise of mobile and APIs. Modern programming languages can interpret and produce JSON out of the box.

[Learn about JSON >](#)

Public Discoverability

Organizations must post their plans.json, providers.json, and drugs.json files on their websites, accessible to the public.

The path to the URLs will be submitted via HIOS to CMS.

The JSON URLs listed above must be provided over HTTPS to ensure the integrity of the data.

Health Plans - plans.json

Description

plans.json contains a list of health plans and their corresponding network of providers and formularies.

Schema

Field	Label	Definition	Required
plan_id_type	ID Type	Type of Plan ID. The preferred is the HIOS Plan ID - HIOS-PLAN-ID	Always
plan_id	Unique Identifier	The 14-character, HIOS-generated Plan ID number. (Plan IDs must be unique, even across different markets.)	Always
marketing_name	Marketing Name	The name of the plan as it is displayed on HealthCare.gov	Always
summary_url	URL for Plan Information	The URL that goes directly to the summary of benefits and coverage for the specific standard plan or plan variation.	Always
marketing_url	URL for Plan Information	The URL that goes directly to the plan brochure for the specific standard plan or plan variation.	No
plan_contact	Contact Email Address for Plan	An email address for developers/public to report mistakes in the network and formulary data.	Always
network	Network	Array of networks	Always
formulary	Formularies	Array of drug lists	Always
last_updated_on	Last Updated On	ISO 8601 format (e.g. YYYY-MM-DD)	

Network sub-type

Field	Label	Definition	Required
<i>network_tier</i>	Network Tier	Tier for network (Example Values: PREFERRED, NON-PREFERRED, etc. Values should be all uppercase.)	Always

Formulary sub-type

Field	Label	Definition	Required
<i>drug_tier</i>	Drug Tier	Tier for formulary - (Example Values: GENERIC,PREFERRED-GENERIC, NON-PREFERRED-GENERIC,SPECIALTY, BRAND, PREFERRED-BRAND, NON-PREFERRED-BRAND, ZERO-COST-SHARE-PREVENTIVE, MEDICAL-SERVICE, etc. Values should be all uppercase.)	Always
<i>mail_order</i>	Mail Order	Does the formulary cover mail order? - (Values: trueor false)	Always
<i>cost_sharing</i>	Cost Sharing	Array of cost sharing values (see "Cost sharing sub-type" below)	Always

Cost sharing sub-type

Field	Label	Definition	Required
<i>pharmacy_type</i>	Pharmacy Type	Pharmacy type (Example Values: 1-MONTH-IN-RETAIL, 1-MONTH-OUT-RETAIL, 1-MONTH-IN-MAIL, 1-MONTH-OUT-MAIL, 3-MONTH-IN-RETAIL,3-MONTH-OUT-RETAIL , 3-MONTH-IN-MAIL, 3-MONTH-OUT-MAIL)	Always
<i>copay_amount</i>	Copay amount	Amount of copay, in \$ (number)	Always
<i>copay_opt</i>	Copay option	Qualifier of copay amount (Values: AFTER-DEDUCTIBLE, BEFORE-DEDUCTIBLE, NO-CHARGE,NO-CHARGE-AFTER-DEDUCTIBLE	No

coinsurance_rate	Coinsurance rate	Rate of coinsurance (float, 0.0 to 1.0)	Always
coinsurance_opt	Coinsurance option	Qualifier for coinsurance rate (Values: AFTER-DEDUCTIBLE, NO-CHARGE, NO-CHARGE-AFTER-DEDUCTIBLE)	No

Example

```
[
  {
    "plan_id_type": "HIOS-PLAN-ID",
    "plan_id": "12345XX9876543",
    "marketing_name": "Sample Gold Health Plan",
    "summary_url": "http://url/to/summary/benefits/coverage",
    "marketing_url": "http://url/to/health/plan/information",
    "plan_contact": "email@address.com",
    "network": [
      {
        "network_tier": "PREFERRED"
      },
      {
        "network_tier": "NON-PREFERRED"
      }
    ],
    "formulary": [
      {
        "drug_tier": "GENERIC",
        "mail_order": true,
        "cost_sharing": [
          {
            "pharmacy_type": "1-MONTH-IN-RETAIL",
            "copay_amount": 20,
            "copay_opt": "AFTER-DEDUCTIBLE",
            "coinsurance_rate": 0.1,
            "coinsurance_opt": "BEFORE-DEDUCTIBLE"
          },
          {
            "pharmacy_type": "1-MONTH-IN-MAIL",
            "copay_amount": 0,
            "copay_opt": "NO-CHARGE",
            "coinsurance_rate": 0.2,
            "coinsurance_opt": null
          }
        ]
      },
      {
        "drug_tier": "BRAND",
        "mail_order": true,
        "cost_sharing": [
          {
            "pharmacy_type": "1-MONTH-IN-RETAIL",
            "copay_amount": 15,
            "copay_opt": null,
            "coinsurance_rate": 0,
            "coinsurance_opt": null
          }
        ]
      }
    ]
  }
]
```

```

    {
      "pharmacy_type": "1-MONTH-IN-MAIL",
      "copay_amount": 20,
      "copay_opt": "AFTER-DEDUCTIBLE",
      "coinsurance_rate": 0.1,
      "coinsurance_opt": "BEFORE-DEDUCTIBLE"
    }
  ],
  "last_updated_on": "2015-03-17"
}
]

```

Providers - providers.json

Description

providers.json contains a list of providers and the plans that cover their services.

Schema

Field	Label	Definition	Required
npi	National Provider ID	The National Provider Identifier (NPI) is a unique identification number for covered health care providers	Always
type	Type	Specify if INDIVIDUAL or FACILITY	Always
plans	Plans	Array of plans that cover this provider (see "Plans sub-type" below)	Always

If the entry is for an INDIVIDUAL then the following fields should be present:

Field	Label	Definition	Required
name	Name	-	Always
prefix	Prefix	-	No
first	First Name	-	Always

<i>middle</i>	Middle Name	-	Always
<i>last</i>	Last Name	-	Always
<i>suffix</i>	Suffix	-	No
address	Address	-	Always
address	Street Address	-	Always
address_2	Street Address 2	-	No
city	City	-	Always
state	State Abbreviation	-	Always
zip	Zip Code	-	Always
phone	Phone Number	-	Always
specialty	Specialty Type	-	Always
accepting	Accepting Patients	Is the provider accepting patients? - (Values:true or false)	Always
associated_npis	Associated NPIs	NPIs of facilities the individual is currently associated with	No

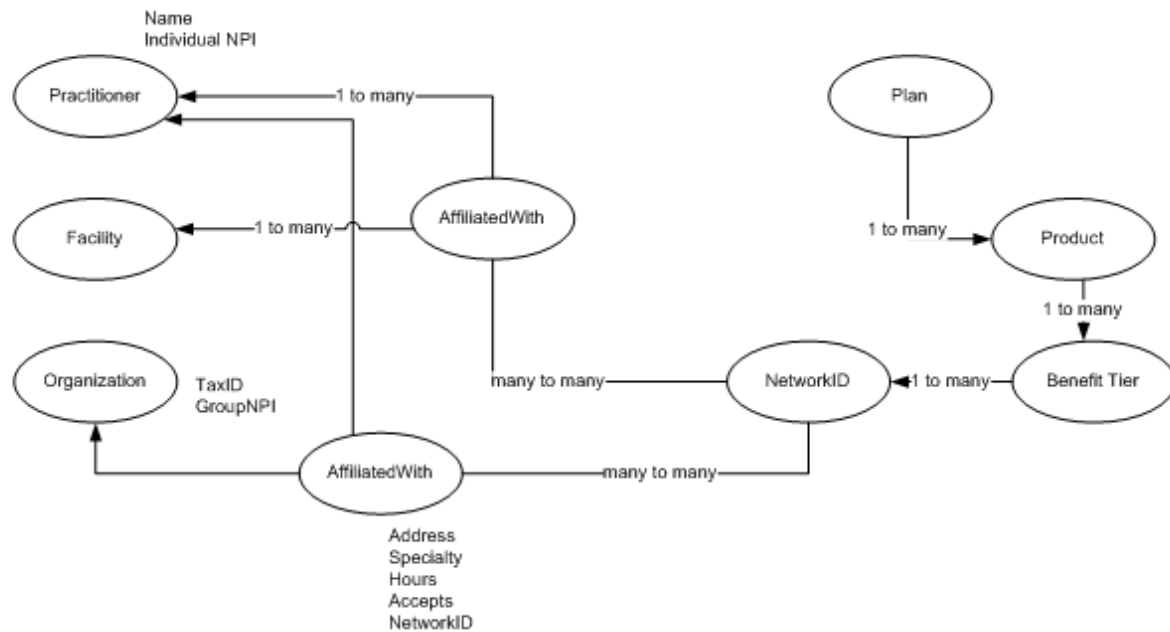
If the entry is for a FACILITY then the following fields should be present:

Field	Label	Definition	Required
-------	-------	------------	----------

facility_name	Facility Name	-	Always
facility_type	Facility Type	-	Always
address	Address	-	Always
address	Street Address	-	Always
address_2	Street Address 2	-	No
city	City	-	Always
state	State Abbreviation	-	Always
zip	Zip Code	-	Always
phone	Phone Number	-	Always
	Parent Facility NPI	The NPI of the parent facility, if there is one.	No

Plans sub-type

Field	Label	Definition	Required
<i>plan_id_type</i>	ID Type	Type of Plan ID. The preferred is the HIOS Plan ID -HIOS-PLAN-ID	Always
<i>plan_id</i>	Unique Identifier	The 14-character, HIOS-generated Plan ID number. (Plan IDs must be unique, even across different markets.)	Always
<i>network_tier</i>	Network Tier	Tier for network (Example Values: PREFERRED, NON-PREFERRED, etc. Values should be all uppercase.)	Always



Example

```

[
  {
    "npi": "1234567890123456",
    "type": "INDIVIDUAL",
    "name": {
      "first": "Sarah",
      "middle": "Maya",
      "last": "Ngyuen",
      "suffix": "Jr."
    },
    "address": {
      "address": "123 Main Street",
      "address_2": "Suite 120",
      "city": "Little Rock",
      "state": "AR",
      "zip": "72201"
    },
    "phone": "2025551212",
    "specialty": "Ophthalmology",
    "accepting": true,
    "plans": [
      {
        "plan_id_type": "HIOS-PLAN-ID",
        "plan_id": "12345XX9876543",
        "network_tier": "PREFERRED"
      },
      {
        "plan_id_type": "HIOS-PLAN-ID",
        "plan_id": "12345XX9876543",
        "network_tier": "NON-PREFERRED"
      }
    ]
  },
  {
    "npi": "1234567890123949",
  }
]
  
```

```

    "type": "FACILITY",
    "facility_name": "Main Street Hospital",
    "facility_type": "Hospital",
    "address": {
      "address": "123 Main Street",
      "address_2": "Suite 120",
      "city": "Little Rock",
      "state": "AR",
      "zip": "72201"
    },
    "phone": "2025551212",
    "plans": [
      {
        "plan_id_type": "HIOS-PLAN-ID",
        "plan_id": "12345XX9876543",
        "network_tier": "PREFERRED"
      },
      {
        "plan_id_type": "HIOS-PLAN-ID",
        "plan_id": "12345XX9876543",
        "network_tier": "NON-PREFERRED"
      }
    ]
  }
]

```

Drugs - drugs.json

Description

drugs.json contains a list of drugs and the plans that cover them.

Schema

Field	Label	Definition	Required
rxnorm_id	Drug Identifier	RxCUI (Specific drug identifier from RXNORM)	Always
drug_name	Drug Name	Name of Drug	Always
plans	Plans	Array of plans that cover this drug (see "Plans sub-type" below)	Always

Plans sub-type

Field	Label	Definition	Required
-------	-------	------------	----------

<i>plan_id_type</i>	ID Type	Type of Plan ID. The preferred is the HIOS Plan ID - HIOS-PLAN-ID	Always
<i>plan_id</i>	Unique Identifier	The 14-character, HIOS-generated Plan ID number. (Plan IDs must be unique, even across different markets.)	Always
<i>drug_tier</i>	Drug Tier	Tier for formulary (Example Values:GENERIC, PREFERRED-GENERIC, NON-PREFERRED-GENERIC, SPECIALTY, BRAND,PREFERRED-BRAND, NON-PREFERRED-BRAND,ZERO-COST-SHARE-PREVENTIVE, MEDICAL-SERVICE, etc. Values should be all uppercase.)	Always
<i>prior_authorization</i>	Prior Authorization Required	Is prior authorization required? - (Values:true or false)	Always
<i>step_therapy</i>	Step Therapy Required	Is step therapy required? - (Values: trueor false)	Always
<i>quantity_limit</i>	Quantity Limit	Is there a quantity limit for this drug? - (Values: true or false)	Always

Example

```
[
  {
    "rxnorm_id": "209459",
    "drug_name": "Acetaminophen 500 MG Oral Tablet [Tylenol]",
    "plans": [
      {
        "plan_id_type": "HIOS-PLAN-ID",
        "plan_id": "12345XX9876543",
        "drug_tier": "GENERIC",
        "prior_authorization": false,
        "step_therapy": false,
        "quantity_limit": false
      },
      {
        "plan_id_type": "HIOS-PLAN-ID",
        "plan_id": "56748XX1239330",
        "drug_tier": "GENERIC",
        "prior_authorization": false,
        "step_therapy": false,

```

```

        "quantity_limit": false
    },
    ],
    },
    {
        "rxnorm_id": "248656",
        "drug_name": "Azithromycin 500 MG Oral Tablet [Zithromax]",
        "plans": [
            {
                "plan_id_type": "HIOS-PLAN-ID",
                "plan_id": "12345XX9876543",
                "drug_tier": "GENERIC",
                "prior_authorization": false,
                "step_therapy": false,
                "quantity_limit": true
            },
            {
                "plan_id_type": "HIOS-PLAN-ID",
                "plan_id": "56748XX1239330",
                "drug_tier": "GENERIC",
                "prior_authorization": false,
                "step_therapy": false,
                "quantity_limit": false
            }
        ]
    }
]

```

Points of Consensus

1. Providers should be identified by their National Provider Identifier - either Type 1 - Individual or Type 2 Facility (in accordance with NPI Final Rule <http://www.cms.gov/Regulations-and-Guidance/HIPAA-Administrative-Simplification/NationalProviderIdentifierStand>)
 - a. An organization health care provider can get an NPI for its subparts if a sub-part conducts any HIPAA standard transactions on its own , apart from its parent);
2. Individual physicians should be linked to a facility and a network;
3. Existing standards for taxonomy categorization for providers should be used;
4. Capture unique coverage or service specialties such as telemedicine. These will become more common as States mandate the coverage and the federal government and commercial payers begin to provide coverage;
5. Address(es) are important, must be a way to validate/verify the accuracy and currency of each one;
6. Entries must be date stamped;
7. HIOS ID, Payer ID and Network ID were mentioned as possible data elements to capture and for the purpose of identifying providers. HIOS ID is only relevant to the market place. Payer ID is the term used for routing transactions and may not be the same entity as the HIOS ID;

8. Product and tiers for each plan and provider should be included. Caveat: Benefits can change annually and are different for each employer or contract (not every product and tier is the same for every plan in the commercial market);
9. There is interest in capturing unique information about office locations: accessibility, hours, accepting new patients;
10. Stride Health provided a comprehensive set of recommendations, including the statement from the AMA and PhRMA regarding the proposal to have changes made to the Summary of Benefits Coverage to help consumers make plan selections and determine whether plans cover the drugs they take. Such disclosure, standardization, and comparison with the SBC would allow the AMA, PhRMA, FFM navigators and other health insurance brokers with software capability to analyze formulary data and obtain expedient answers to questions about drug coverage. The sample template is saved in google docs.

Did not include comment about capturing deductibles and copayments for each product and benefit package in which a provider is contracted to participate; could be dozens of these for each provider under each contract for each insurer with which s/he is listed. Not certain I understood what the proponents were suggesting for the directory.

ltd

also, is this only for Marketplace and not for any other lines of business?

TBD:

1. Providers.json
 - a. contract_lapsed status
2. affiliated_with object ← Either separate JSON or array
3. Practice type:
 - a. Telemed, national DME organizations, local "on demand" house call docs, medical tourism abroad
4. Misc attributes
 - a. Facility: hours, handicap accessible status, specialties at a location. At minimum the practice should be able to flag whether they are accepting new patients.

Schema Hierarchy Analysis

Fields defined by CMS

Field Name	Description	Data Type	Example	Data analysis

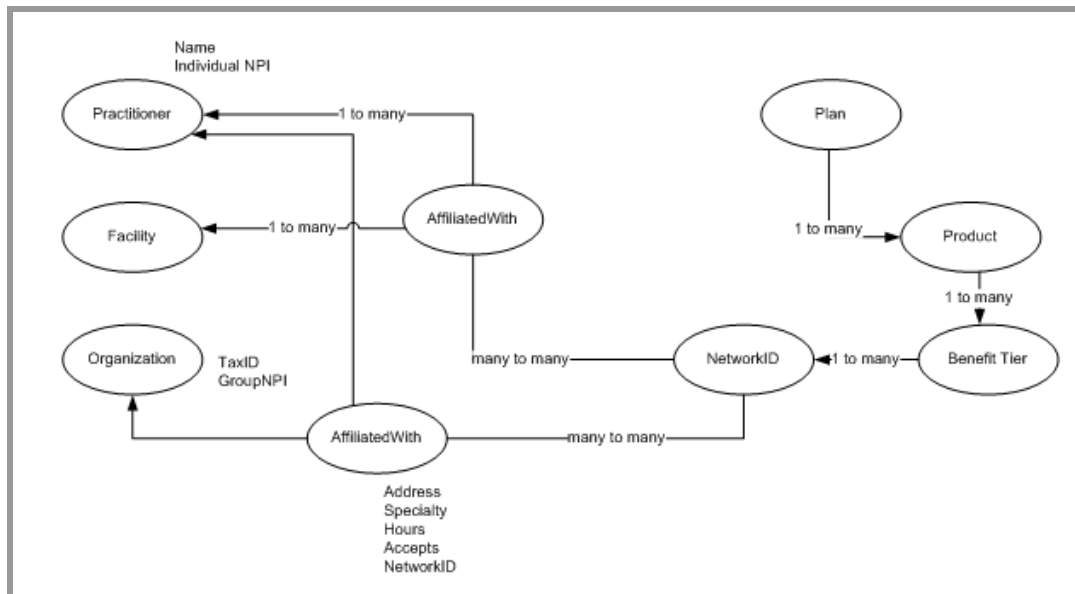
IssuerID	Numeric code that identifies the issuer organization in the Health Insurance Oversight System (HIOS)	5 char	16724	783 unique
HIOSProductId	Alphanumeric code that identifies an insurance product within HIOS	10 char	16724IL001	2.3k unique
StandardComponentId	HIOS Plan ID (Standard Component) Associated with PlanMarketingName, such as "UnitedHealthcare Silver Compass 5000"	14 char	16724IL0010001	10k unique
PlanId	17 character code that identifies an insurance plan's cost sharing reduction (CSR) variant within HIOS Associated with CSRVariationType, such as "94% AV Level Silver Plan"	17 char	16724IL0010001-00	31k unique
NetworkId	Identifier for a health care provider network organization Has an associated ServiceAreaId	6 char	ILN006	234 unique
ServiceAreaId	Identifier for a service area	6 char	ILS001	313 unique

Relationships & cardinality

# of plans / product (A product has multiple plans)	# products / plan (A plan has only 1 product)
--	--

min	1	min	1
max	182	max	1
avg	4.3	avg	1
median	2	median	1

# of networks / product (A product (typically) uses only 1 network)		# products / network (A network can be used in many products)	
min	1	min	1
max	11	max	106
avg	1.07	avg	10.8
median	1	median	3



Lowest level of granularity

Uniqueness is defined by PlanId

PlanId	CSRVariationType
17 character alpha-numeric code that identifies an insurance plan's cost sharing reduction (CSR) variant within HIOS	Name of the cost sharing reduction options offered for a health insurance plan
36096IL0790001-00	Standard Gold Off Exchange Plan
36096IL0790001-01	Standard Gold On Exchange Plan

36096IL0790001-02	Zero Cost Sharing Plan Variation
36096IL0790001-03	Limited Cost Sharing Plan Variation

Proposed changes to existing JSON

Challenge as of 7/27/2015: How to capture the plan coverage and accepting patients data at a lower level of granularity, keeping in mind that CMS is not likely to accept significant changes in the proposed schema this late into the rule making process.

Now	Proposed
Provider.json • NPI • type: Individual, facility ◦ address • Plans ◦ Plan a ◦ Plan b ◦ Plan c	Provider.json ❁ • NPI • type: Individual, facility ◦ address • Plans ◦ Plan a ■ Facility • Address • Hours • Accepting • Specialty • NetworkID ■ Organization • Address • Hours • Accepting • Specialty • NetworkID ■ Address a-a • Hours • Accepting • Specialty • NetworkID ◦ Plan b ◦ Plan c
	❁ Note: All fields added would most likely need to be optional initially

At a later date, we can split up the schemas based on who provides the data

Now	Proposed
Provider.json • NPI • type: Individual, facility ◦ address • Plans ◦ Plan a ◦ Plan b ◦ Plan c	Issuer.json • Network (req'd) • Product (req'd)