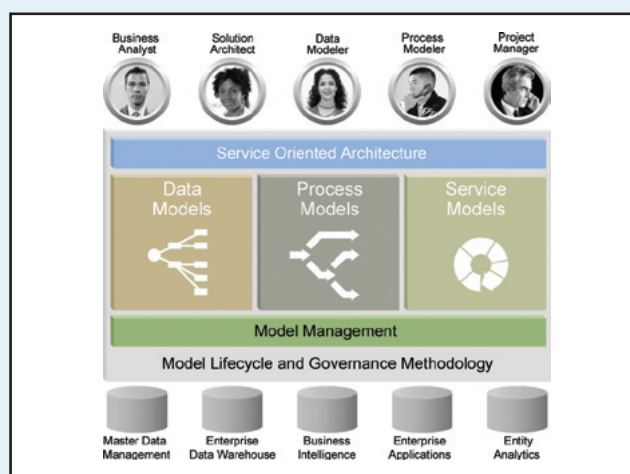




## Executive Summary

While change is a constant in virtually every industry today, few industries are changing as rapidly as the health care industry. As the transformation to a consumer-centric business model continues to gain momentum, the health care industry could see more change in the next three years than it has seen in the last thirty.

The consequences of this transformation are far-reaching. Added to the ever-present challenges of cutting costs, improving the quality of care and keeping pace with regulations, there are greater demands on health plans to stay ahead of the competition—by offering new products and services, anticipating customer needs and providing superior service. This in turn depends on a deep knowledge and understanding of members, providers, brokers and partners, and finding new ways to deepen existing relationships.



But for many health plans, the information that is critical to understanding customers and operations is not easily accessible. While there's no shortage of data, it's often spread across numerous information silos and in multiple formats, making it nearly impossible to turn this information into the type of actionable insight that can drive competitive differentiation.

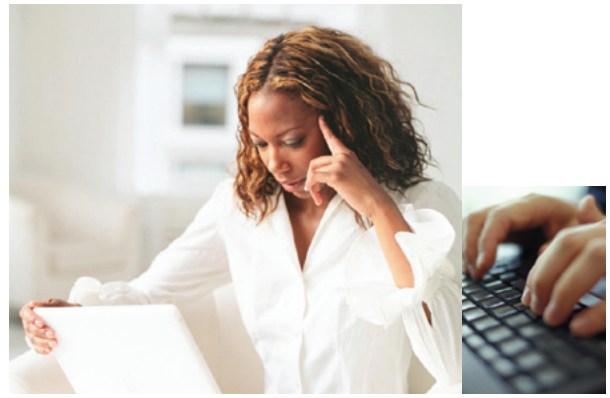
The Health Plan Data Models from IBM provides a blueprint for comprehensive data warehouse business intelligence applications that run on it, as well as the foundation for an

operational model based on data architecture best practice principles. This executive brief discusses how the Health Plan Data Models can help you establish a platform to gain a more complete understanding of your members, providers, partners and thereby help you choose the best strategies for:

- *Aligning IT with business goals.*
- *Offering differentiated products and services.*
- *Streamlining administrative operations.*
- *Facilitating compliance measures.*
- *Promoting effective decision making.*
- *Encouraging environmental evolution.*

### Includes support for major business issues:

- *HIPAA - Traceability of data to all HIPAA EDI standards*
- *HEDIS® - Enables the collection/storage of data elements that support HEDIS reporting*
- *PHR - Complete data support for BCBSA AHIP Personal Health Record Transfer Standard*



Achieve greater insight for greater profitability  
Faced with so many challenges, health plans have responded in a number of ways to try to lower costs—from consolidation through mergers and acquisitions, to reducing benefits levels. At the same time, they've sought to gain critical customer insights by implementing one or more data warehouses or data marts to gather information.

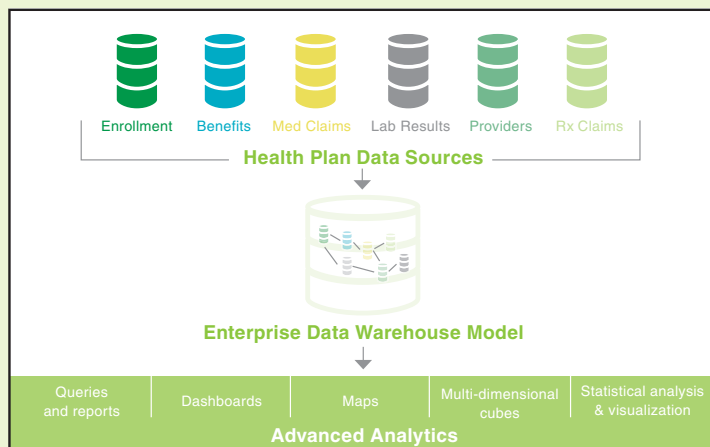
But these efforts are no longer enough. Many health plans have simply outgrown the functionality and effectiveness of their current data models, and cannot achieve the level of data analytics capabilities necessary to fully understand the broad range of activities conducted by its consumers and operations. And as we move into an age of consumerism, particularly in an industry where there are multiple consumers—member, employer, provider and broker—the need for data is critical.

What is needed to meet these demands are innovative solutions that can provide the foundation for a broad range of query-based and real-time business intelligence activities that can effectively integrate and analyze information from a wide range of data sources. The foundation needs to be robust enough to support current needs and extensible and scalable enough to support future requirements that may still be unknown. The bottom line is that health plans today need the business intelligence capabilities that will enable them to respond and get in front of anticipated and unanticipated changes that are expected to occur in this dramatically dynamic market.

Yet health plans typically lack an integrated and conformed analytical information space that can effectively extract meaningful information from a wide range of disparate data. Instead, collecting and analyzing the data often falls on the knowledge worker, who must:

- *Access multiple applications and databases, such as multiple claim systems.*
- *Find and interpret disparate data from multiple sources of information.*
- *Perform manual calculations to find out information, such as how many additional costs are incurred for out-of-service plans or formulary medication spending.*

A robust data model that is extensible and scalable to fit a health plan's unique environment offers significant competitive advantage through the ability to create an analytical data store that connects to all of your critical data, across disparate systems and formats, across diverse departments and other data providers. It helps you build a dynamic analytics world, where data collected internally and externally is used to determine how to arrange, align, deploy and improve services to members. It forms the foundation of a true Information On Demand infrastructure—where trusted, relevant information is available to the people who need it, when they need it, so they can make better and timelier decisions.



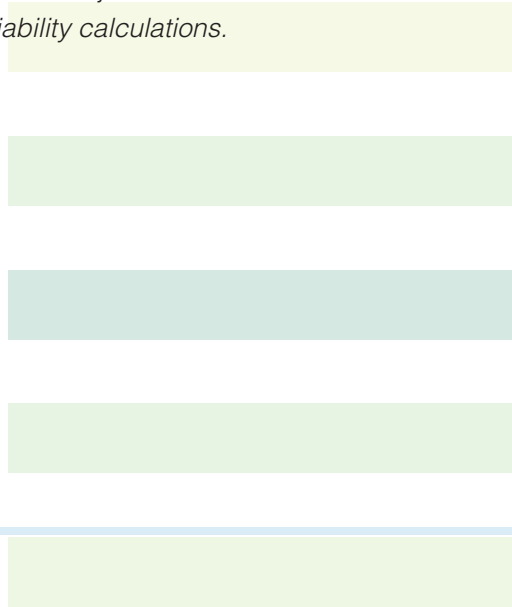
In short, it provides the foundation for deeper insights, enabling you to more easily:

- **Understand members and groups**—Meeting the demands of members and sponsors requires a careful evaluation of the service and programs you deliver. By doing so, you can discover new ways to reach them—from incentive programs for behavior modification to medical advocacy and disease management programs.

- **Understand providers and networks**—With deeper insights, you can more clearly evaluate the performance and quality of contracted providers. The first step toward pay-for-performance programs, you can identify high-performance networks and achieve greater pricing transparency.

- **Improve claims handling and adjudication**—Analyzing claims processing information, benefits management partners and claims processing vendors can help you identify areas of underperformance, overpayment, and fraud and abuse. With this information in hand, you can take corrective action to minimize risks and revenue leakage and help:

- *Utilize more clinical data.*
- *Improve auto-adjudication rates.*
- *Provide point-of-service adjudication.*
- *Improve member liability calculations.*



• **Improve medical management**—The more granular the information you have, the better chance you have of understanding the ways medical care is utilized. The ICD-10 standard—created and adopted by the World Health Organization (WHO) in 1994—already offers greater detail to improve analysis. With effective analysis technologies to more effectively stratify members, you can build on this information to identify areas for targeted programs, e.g., identifying high-risk patients to support care and disease management.

• **Offer new products and services**—Analyzing and comparing the effectiveness of customer and product promotions and sales can help you better determine how to differentiate offerings. When you understand the activities of members, you can categorize them to better understand patterns of utilization, fine tune underwriting, and craft new consumer-directed products and services to reach new market areas such as medical tourism and retail medicine, while improving member retention along the way.

• **Improve underwriting and profitability**—Analyze products, features and return on investment and risk factors to better inform decisions on underwriting a product or group. Or perform actuarial financial analysis to determine rates and premiums for products. By doing so, you can speed the transformation from a product company to a services company and position your organization for rapid margin growth.

## **A blueprint for success**

The only thing more critical to your strategy than having the right data warehouse solution is how you implement it. The more you can reduce the time and cost required upfront, the greater value you can achieve. The platform-independent Health Plan Data Models offering contains thousands of hours' worth of development effort and expertise to help business users and IT staff implement an enterprise data warehouse on time and on budget.

The Health Plan Data Models offering builds upon the market-leading IBM Insurance Application Architecture offerings for life, property and casualty insurance firms, but are designed exclusively for the health plan industry. The models provide a glossary of requirements, terms and concepts that can be clearly understood and communicated by both business and IT, thereby helping to accelerate project scoping, appropriate reporting, data quality and data requirements and identifying sources of data. Ultimately, it acts as a blueprint by defining the structures necessary to build an effective data warehouse and provides health plan managers with critical pre-built reporting templates that offer a wide and deep view of their business through key performance indicators and other measures.





With the IBM Health Plan Data Models, it becomes easier to more accurately analyze cost per insurer, evaluate cost against quality of care and measure the effectiveness of fee-for-service programs. Even seemingly overwhelmingly tasks like providing a complete audit trail of care management from delivery to outcome become simpler. Some of the key components include:

### **Requirements Layer**

The HPDM Requirements Model is a set of inter-related concepts that support the Business Requirements Definition Phase. The Requirements Layer is organized to facilitate the identification, analysis and structuring of business requirements. Its content reflects the business user's perspective and terminology: business people should always feel comfortable with and recognize their business in the Requirements Layer, after customization according to their specific requirements. The Requirements Layer contains the Business Terms Model and the Reporting Requirements Model.

The IBM Health Plan Data Models are an enterprise-wide framework that defines how multiple sources of data should be consolidated into a single, extensible and scalable structure that enables the use of creative business analytics to extract useful information from a large array of data sources. The solution delivers an enterprise-wide vocabulary of more than 3,000 healthcare business terms to support requirements gathering and provide common semantic definitions.

#### **Business Terms Model**

The Business Terms model is a conceptual Data Model that provides a structured data dictionary defining the business vocabulary and phrases used within the Health Plan industry. In addition, it defines any inter-relationships that exist between the concepts underlying those terms and phrases.

#### **Requirements Model (Business Solution Templates)**

The Requirements Model models analytical reporting requirements needed by the Health Plan. It contains pre-defined OLAP (On-Line Analytical

Processing) conceptual templates, known as Business Solution Templates (BSTs), for reporting needs commonly found in the Health Plan industry.

The Health Plan Business Solution Templates consist of numerous best practice key performance indicators that enable business managers to quickly and easily specify analytical reporting requirements that form the basis of reports and executive dashboards. The templates are grouped into focus areas and provide the framework to rapidly define and deliver high-value business intelligence applications.

You can implement them in phases—choosing the capabilities that can benefit your business the most today, then build out more as your needs change. Business users can also easily work with the templates to specify their own analytic reporting requirements. The solution templates feature data mart designs for the following business areas:

### **Enterprise Layer**

The purpose of the Enterprise Layer is to hold models that will move the development process forward from the capture of requirements at the Requirements Layer into the identification of design constructs that will enable those requirements to be met.

#### **Enterprise Data Model**

The Enterprise Data Model (EDM) is a logical entity-relationship model that represents the essential entities and relationships of the Health Plan industry, and includes design constructs suitable for warehousing, end user querying, ODS, etc.

The EDM is an implementation-focused logical model that is independent of any particular data repository, but with sufficient coverage to allow any such repository to be built. Whereas the models of the Requirements Layer state what needs to be modeled, the EDM shows how to model those requirements within a common design basis for all data repositories.

It is important to note that the EDM is not intended to be implemented itself. Rather, the EDM includes common constructs that can be transformed into structures suitable for dedicated purposes such as ODS, warehousing, etc. It is these derived models that get implemented into installed data repositories.

The key data concepts of the EDM have been chosen based on IBM's experiences achieved over more than a decade of developing industry models in multiple industries and customizing them to suit the exact needs of hundreds of individual clients.

### Application Layer

The Application Layer contains one or more Application Models, each of which is dedicated to a specific form of data repository.

Each Application Model contains a specific physicalization and optimization of the Enterprise Data Model to support the exact required functionality of the particular style of data repository. The design elements of the Enterprise Data Model are mapped down to the elements in the Application Model that implement that design within a specific application context.

### Core Warehouse Model

The Core Warehouse Model (CWM) is a physicalization and optimization of the Enterprise Data Model (EDM) for a data repository that needs to hold long-term history, usually across the entire

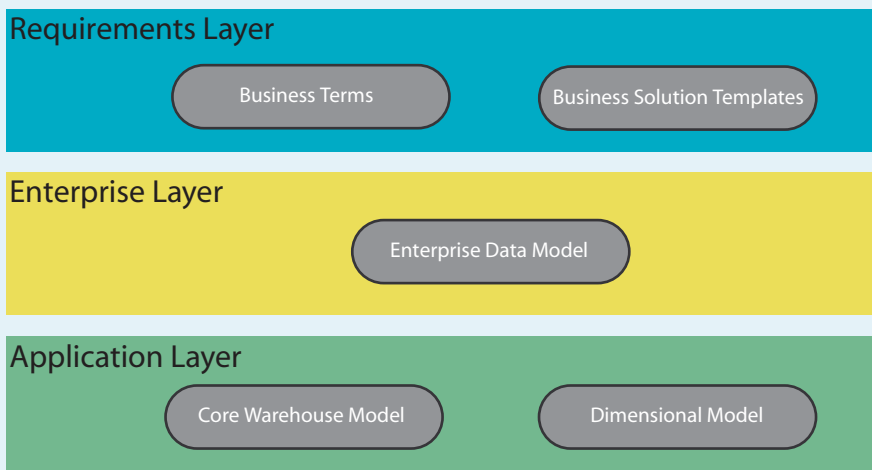
enterprise. The CWM provides the data design support needed to uniformly model the business requirements - captured through use of the models of the Requirements Layer and designed at an enterprise level by the EDM - into specific flexible and efficient structures dedicated to the storage of long-term historical facts.

Usage of the Key Concepts such as Role Player, Agreement, etc. which are independent of any eventual query usage gives a high degree of flexibility to the Core Warehouse Model. The history structures used have been developed over a decade of warehouse design to give the efficient storage structures required.

### Conformed Dimensional Model

The Conformed Dimensional Model (CDM) is a physicalization and optimization of the Enterprise Data Model (EDM) for a data repository that needs to support analytical queries by end users, usually across the entire enterprise.

The CDM provides the data design support needed to uniformly model the business requirements - captured through use of the models of the Requirements Layer and designed at an enterprise level by the EDM - into specific flexible and efficient structures dedicated to the design of a dimensional data repository intended to hold sufficient and complete data to meet the needs of specific analyses required and requested by business users.



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**The IBM Health Plan Data Models can help reduce the risk of implementing a data warehouse while considerably reducing time and cost. Key benefits:**

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- Enables business users to easily scope and customize their own requirements
  - Facilitates step-by-step, business-focused development and rollout
  - Delivers regularly updated business, technical and regulatory content
  - Manages definitions and standards in complex IT environments
  - Sets the foundation for real-time analytics model
  - Data architecture based on data modeling best practices
  - Is aligned with Master Data Management and SOA strategy going forward
  - Is continually updated to reflect changes and trends in the healthcare industry
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**Get flexible**

With their strong business and IT orientation, the IBM Health Plan Data Models can be customized to reflect the exact needs of every company using them, including the areas that are specific to their business and unique competitive advantages. Even more important, the models are flexible enough to evolve with the ever-changing requirements of the health plan industry. Unlike proprietary solutions, the open standards-based IBM Health Plan Data Models solution makes it easy to build out additional features on demand and readily accommodates extensions.

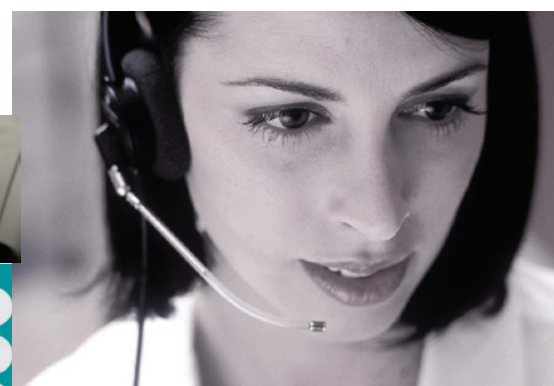
**Summary**

The Health Plan Data Models from IBM reaches far beyond simple data gathering. It offers a significant competitive advantage through the ability to continuously process data, from member information to medical care utilization, and transform it into information-led business initiatives. By unlocking information contained in individual applications and repositories from a variety of vendors and making it readily available to the people and processes that need it, the Health Plan Data Models from IBM get you one step closer to a true Information On Demand infrastructure.

**Health Plan Data Warehouse Solution**

This comprehensive solution offering exploits a range of components from across the IBM software platform as well as best-in-class Business Partner applications. These include some or all of the following:

- *IBM Information Server—*for delivery of trusted, consistent and reusable information
- *IBM DB2® Data Warehouse Edition—*integrated platform for dynamic data warehousing
- *IBM WebSphere® Customer Center—*real-time, transactional customer data integration
- *IBM InfoSphere® Data Architect—*enterprise data modeling tool
- *Business Intelligence applications—*tools from IBM Business Partners





## Business Coverage of the Health Plan Models

### Brand & Product Marketing

To analyze the image of the Health Plan's brands and products in the marketplace, among employers, members, potential members, providers and competitors. Having a comprehensive view of all brand and product marketing enables the plan to more effectively sell to target market segments.

**Household Value Analysis** - The household value analysis records aggregate measures related to the number of policies held by each household in the membership, number of people in the household, number of adults, number of children.

**Market Analysis** - The analysis of market trends.

**Marketing Expense Analysis** - Analysis of the key performance indicators for the marketing processes, to improve profit margin.

**Marketing KPI For Growth Analysis** - Analysis of the key performance indicators for the marketing processes, to grow revenue.

**Marketing Optimization Analysis** - Analysis of the key performance indicators for the marketing processes, to optimize capital efficiency and manage enterprise risk.

**Member Behavior Analysis** - Analysis of contracts held by the policyholder as well as movements made by the policyholder in each contract.

### Campaign

To analyze and compare the effectiveness of customer promotions, product promotions, marketing drives and advertising strategy. By keeping track of campaign cost, results and effect on product sales and services revenue, the Health Plan can determine the overall campaign effectiveness..

**Campaign Contact Analysis** - The campaign contact analysis records measures related to communications generated by a sales, marketing or member satisfaction campaign.

**Campaign Cost Analysis** - The campaign cost analysis records measures related to the variable cost of the outbound and inbound contacts executed in a campaign.

**Campaign Profitability Analysis** - The campaign profitability analysis records measures related to the revenues generated by a campaign as well as the costs associated with it.

**Campaign Sales Analysis** - A measure of campaign success from the member and premium perspective : new members gained, existing members cross-sold to, members who purchased new products but cancelled prior policies, members contacted who did not buy new products, and the premiums earned from each category. As Group and Campaign category are specifically available as a dimension, this analysis is applicable to Group or Individual member types.

### Claims Adjudication

To analyze adjudicated claims in order to understand the numbers, amounts and types of claims received and paid and the impact of plan design and provider arrangements on claims. By understanding trends and variations in claims by sponsor, geography, processing unit, and other aspects, the health plan can better predict expected claim payments and identify potential process, technology and organizational improvements such as training for claims examiners, provider administrative staff, or product design modifications to better manage costs. The analysis also includes coordination of benefits to ensure that primary, secondary or tertiary liability is correctly assigned, and that the Health Plan is paying only what it is liable for.

**Claims Adjudication Analysis** - The analysis of claims adjudication in relation to health plan expenditure and trends of health expenditure by type of treatment and health care provider.

**Claims Adjustment Analysis** - Analysis of the number and basis of claim adjustments occurring post adjudication so as to identify improvements in adjudication and general claim handling protocols, and thereby improving operational efficiency and member/provider satisfaction.

**Coordination Of Benefits Analysis** - The analysis of coordination of benefits (COB) activities and the resultant impact on the health plan's claim costs.

## Claims Handling

To analyze information pertaining to the processing of claims by the Health Plan, Benefits Management Partners and Claim Processing Vendors. Analysis includes claim life cycle, claims aging, claims pending, costs related to processing, and the efficiency of claims examiners. By understanding the performance of claims processing activities, the Health Plan can identify areas of underperformance and take corrective action such as process re-design and staff training to improve claim processing throughput and efficiency.

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**Claims Processing Performance Analysis** - The analysis of claims handling activities so as to optimize provider networks, operational efficiency and member/provider satisfaction.

**Claims Processing Resource Utilization Analysis** - The analysis of key performance indicators of the claims management process, to improve profit margin.

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## Claims Recovery

To analyze the position and results of the health plan in the recovery of previously paid claim disbursements. By understanding the circumstances surrounding the original claim payments, the health plan can initiate corrective action to recover funds and address systematic procedural and environmental issues that give rise to instances of overpayment or approving claims that should have been denied.

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**Claims Recovery Activity Analysis** - The analysis of the activities a health plan carries out in order to recover claim payment amounts from reinsurers, co-insurers, providers, members and other third parties.

**Claims Recovery Revenue Analysis** - The analysis of claims in the context of assessing the financial gain from claims recovery activities.

**Claims Recovery Write Off Analysis** - The analysis of claim payment amounts that are recoverable from other parties but have been written off.

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## Disbursements

To analyze payments made to providers, members or other intermediaries in respect of medical service delivery. The analysis includes timeliness, accuracy and method of payment for capitation and incentive payments made to healthcare providers as well as payments directly resulting from claims adjudication.

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**Pay For Performance Analysis** - The analysis of pay for performance incentives and provider performance levels achieved.

**Payee Contact Analysis** - The analysis of communications, such as Explanations of Benefits or Remittance Advices, that accompany payments made to healthcare providers and members.

**Payments Transaction Processing Analysis** - To analyze all payments made by the health plan to providers, members, intermediaries and other parties consequent to the delivery of healthcare insurance.

**Provider Payments Analysis** - The analysis of capitation and claim payments by the health plan to healthcare providers.

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## Disease Management

To identify members for inclusion in disease management programs and to analyze the performance and effectiveness of those disease management programs. By identifying modifications to guidelines, patient or provider education, and programs that improve clinical and financial outcomes, the Health Plan may be more successful in modifying member and provider behavior to maintain and improve health status and reduce the cost of care for chronically ill members.

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**Adult Preventative and Diagnostic Care Quality Analysis** - The analysis of the effectiveness of preventive and screening care given to adult members by the health plan's healthcare providers during a specific measurement period.

**Asthma Disease Management Analysis** - The analysis of the management of members with asthma, allowing the health plan to assess the success of the disease management program, the health status of affected members. Includes analysis of factors that affects risk, reflects successful management, or represents treatment or follow-up for an asthma patient.

**Behavioral Healthcare Quality Analysis** - The analysis of the effectiveness of care delivered to adult and child members with behavioral health conditions during a specific analysis period.

**Cardiovascular Care Quality Analysis** - The analysis of the effectiveness of care delivered to members with cardiovascular conditions during a specific analysis period

**Chronic Disease Management Analysis** - The analysis of the management of members with any type of chronic medical condition. Allowing the health plan to assess the success of the disease management program, through the health status of affected members. Includes analysis of factors that affect risk, reflect successful management, or represents treatment or follow-up for a patient.

**Chronic Stable Angina Disease Management Analysis** - The analysis of the management of members with chronic stable angina allowing the health plan to assess the success of the disease management program, through the health status of affected members. Includes analysis of factors that affect risk, reflect successful management, or represents treatment or follow-up for an angina patient.

**Coronary Artery Disease Management Analysis** - The analysis of the management of members with heart failure allowing the health plan to assess the success of the disease management program, the health status of affected members. Includes analysis of factors that affect risk, reflect successful management, or represent treatment or follow-up for a heart failure patient.

**Depression Disease Management Analysis** - The analysis of the management of members with depression allowing the health plan to assess the success of the disease management program, the health status of affected members. Includes analysis of factors that affects risk, reflects successful management, or represents treatment or follow-up for a depressive patient.

**Diabetes Disease Management Analysis** - The analysis of the management of members with diabetes allowing the health plan to assess the success of the disease management program, the health status of affected members. Includes analysis of factors that affects risk, reflects successful management, or represents treatment or follow-up for a diabetic patient.

**Disease Resource Cost Relativity Analysis** - The analysis of the level of consumption of healthcare resources, by health plan members, when compared with industry utilization trends. This analysis provides greater understanding about the efficiency or value of services rendered by an organization, when compared with the rest of the industry population and also the utilization management efficiency of the organization. Incurred medical service costs, priced using proprietary pricing and fee schedules are reprised using an external or industry standard pricing system and compared to those of peer organizations, risk adjusting for member population case mixes. This analysis may be carried out on members with specific medical conditions, with or without comorbidity conditions and also may be specific to healthcare resource utilization, specific to the treatment of that condition in contrast to all healthcare resource utilization, regardless of the primary diagnosis of the treatment.

**Elderly Preventative and Diagnostic Care Quality Analysis** - The analysis of elderly specific care delivered to members by the health plan's Primary Care Providers.

**Healthcare Program Member Target Analysis** - The analysis to identify members who would benefit from participation in a disease management or other healthcare program. Comparing a member's utilization with others with the same medical condition as well as with members overall enables the health plan to target the members with the greatest potential to benefit from program participation.

**Healthcare Program Selection Analysis** - The analysis to identify health management programs, such as specific disease management programs that the health plan may wish to establish. The health plan will want to consider the disease-specific morbidity and risk for its members as well as the costs and potential benefits to be achieved in deciding which programs to offer.

**Hyperlipidemia Disease Management Analysis** - The analysis of the management of members with Hyperlipidemia allowing the health plan to assess the success of the disease management program, the health status of affected members. Includes analysis of factors that affects risk, reflects successful management, or represents treatment or follow-up for a Hyperlipidemic patient.

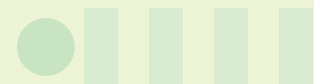
**Hypertension Disease Management Analysis** - The analysis of the management of members with hypertension allowing the health plan to assess the success of the disease management program, the health status of affected members. Includes analysis of factors that affects risk, reflects successful management, or represents treatment or follow-up for a hypertensive patient.

**Member Medication Management Quality Analysis** - The analysis of how successfully healthcare providers are managing the medication of adult and elderly members.

**Member Wellness Analysis** - The analysis of the effectiveness of overall member healthcare management during a specific analysis period.

**Musculoskeletal Care Quality Analysis** - The analysis of the effectiveness of care delivered to members with musculoskeletal conditions during a specific analysis period.

**Pediatric Preventative and Diagnostic Care Quality Analysis** - The analysis of the quality of care given to infants, children and adolescents, by the healthplan's healthcare providers.



**Program Vendor Analysis** - The analysis of the activities of health management program vendors and the costs related to programs.

### Member Retention

To analyze the propensity of the member or sponsor to remain with the Health Plan. While recognizing that the customer may have several plans to choose from in a highly competitive environment and by understanding why certain members remain and why others leave, the Health Plan will be able to enhance benefit offerings and services to improve membership retention.

**Group Retention Analysis** - Analysis of trends in group persistency (group policy renewal and lapse rates) by group characteristics, product, and line of business.

**Member Retention Analysis** - Analysis of the product/product line makeup and loyalty of the member population by member characteristics.

**Policy Event Analysis** - Analysis of events affecting the policy, as a function of policyholder profile, contact method and type of policy.

### Member Service

To analyze service delivered by the health plan to members across various service channels, in order to determine member satisfaction, competitor comparison, and costs and effectiveness of different member service channels.

**Member Access To Care Analysis** - The analysis of members ease of access to health care services.

**Member Call Center Analysis** - Analysis of the effectiveness of the Health Plan's Call Centers in handling enrollment, benefits and claims processing enquiries.

**Member Feedback On Intermediaries Analysis** - Analysis of information received from Members about the performance of intermediaries, whether positive or negative.

**Member Satisfaction Analysis** - The analysis of the satisfaction of members, with regard to their membership experience with the health plan as determined through member surveys, during the period of analysis.

**Member Service Expense Analysis** - Analysis of the key performance indicators of the modeled organization's member service activities, to improve profit margin.

**Member Service KPI For Growth Analysis** - Analysis of the key performance indicators of the modeled organization's Member service activities, to grow revenue.

**Member Service Optimization Analysis** - Analysis of the key performance indicators of the modeled organization's customer service activities, to optimize capital efficiency and manage enterprise risk.

**Parent Satisfaction Analysis** - The analysis of the satisfaction of parents, with regard to their child's membership experience with the health plan.

### Personal Health Record

Reflects the various data domains which may be used to make up an effective Personal Health Record for a patient.

**Advance Directives** - Patient's Advance Directive related data domain as a component of the Personal Health Record. The patient may have a number of Advance Directives included in a Personal Health Record.

**Alerts (Including Allergies)** - Patient's alert related data domain as a component of the Personal Health Record. This contains information regarding situations and substances which could create distress or clinical danger to the patient.

**Benefit Information** - Patient's health benefit related data domain as a component of the Personal Health Record (PHR). Here, "Benefit" relates to the benefits available through a policy regardless of whether any claims have been made or benefit payments provided. The Policy may provide a number of Benefits and the Patient may have a number of Policies so the PHR can contain multiple entries of Benefit Information.

**Encounter** - Encounter data domain as a component of the Personal Health Record (PHR). This represents a history of all the Patient's medical Encounters and consequently there will be multiple entries in the PHR. The Encounter is central to the PHR as it contains details of Medical Services provided, Prescriptions, Diagnoses and resulting Claims.

**Facility** - Patient's treatment facility related data domain as a component of the Personal Health Record.

**Family History** - Family Medical History data domain as a component of the Personal Health Record (PHR). As details of various conditions in a number of family members may have a bearing on the Patient's current or prospective health, there may be a number of Family History entries in the PHR

**Health Plan Information** - Health Plan related data domain as a component of the Patient's Personal Health Record (PHR). As one of the key purposes of the PHR is to allow the Patient's clinical history to be moved between Health Plan Organizations it is possible to hold multiple entries in this domain.

**Health Risk Factors** - Health Risk Factors data domain as a component of the Personal Health Record (PHR). As a number of physiological, employment or lifestyle factors may present risks to the Patient's health, there may be a number of entries for this area in the PHR.

**Immunization** - Immunization data domain as a component of the Personal Health Record (PHR). As an immunization is specific to, at most, a small group of diseases, the patient receives various treatments at different stages of life. Consequently the PHR will contain more than one Immunization entry.

**Medication** - Medication and Prescription data domain as a component of the Personal Health Record (PHR). Medication history is reflected in the Prescriptions written and dispensed on behalf of the Patient, consequently there will be a number of Medication entries within the PHR.

**Patient Information** - Patient Information data domain as a component of the Personal Health Record (PHR). By definition, the individual Patient is the main focus of the Personal Health Record so each PHR will only contain one Patient.

**Physiological Information** - Health Risk Factors data domain as a component of the Personal Health Record (PHR). Historical physiological information relating to the Patient is clinically relevant so a number of entries in this area will be held in the PHR.

**Plan of Care** - Patient's treatment plan related data domain as a component of the Personal Health Record (PHR). The patient may have more than one Medical Condition being treated at any one time and the PHR may also be used to hold historic plans so more than one entry is possible for this domain in the PHR.

**Provider** - Patient's provider related data domain as a component of the Personal Health Record.

**Subscriber Information** - Data domain for information regarding the Subscriber to the Health Benefits Plans of which the Patient is a member. The Patient may be a member of multiple Health Benefit Plans with different subscribers so it is possible to have multiple entries in this domain of the Personal Health Record.

## Pharmacy Benefits

To analyze the utilization and management of pharmacy benefits to understand the effectiveness of pharmacy benefits design, formularies and programs in controlling these costs and to project future prescription benefits costs. Analyzing these data enables health plans to improve the design of the pharmacy benefits and formularies, and to evaluate the performance of their pharmacy benefits management vendors and partners.

**Adverse Drug Events Analysis** - The analysis of adverse drug events (ADEs) to determine the types, causes and the situations in which they occur, the incidence of adverse events by drug, prescriber and pharmacy. For drug-to-drug interactions, analysis includes the other drug involved, its prescriber and dispensing pharmacy.

**Formulary Analysis** - Allows the health plan to analyze the effectiveness its drug formulary in meeting the needs of members in at a reasonable cost. The health plan would use this, for example, to determine if the formulary has too many or too few drugs in various categories, or whether the tiers are appropriate.

**Medication Error Analysis** - The analysis of medication errors to determine the types, causes and the situations in which they occur, the incidence of adverse events by drug, prescriber and pharmacy.

**Member Medication Management Quality Analysis** - The analysis of how successfully healthcare providers are managing the medication of adult and elderly members.

**Outpatient Pharmacy Benefits Analysis** - The analysis of outpatient utilization of drug products, including costs and savings achieved by generic substitution, formulary usage, and mail order.

**Pharmacist Service Analysis** - The analysis of pharmacist services to understand the frequency, cost and results, and to determine the situations in which they occur by diagnosis, drug, prescriber, pharmacy and patient characteristics.

**Prescriber Analysis** - The analysis of provider prescribing patterns in terms of overall drug use, formulary compliance, and generic prescribing. This allows the health plan to compare patterns across specialties and geography, and to identify prescribers who are outliers given their specialty and patient mix. These insights can then be used for provider feedback and education and as input to provider performance analysis.

**Selective Drug Utilization Analysis - Antibiotics** - The analysis of the outpatient utilization among members, of any drug class of interest or concern, during the period of analysis, e.g. Antibiotics.

## Product Management

To analyze and compare product features to determine optimal product design in terms of competitive positioning, sales, medical loss, operations, and member or provider satisfaction. With deep product awareness at your fingertips, you can respond promptly to changes in the market place by modifying product design and life cycle. .

**Business Profitability Analysis** - Business profitability analysis focuses on high level profit, cost and revenue by product, line of business, and other factors.

**New Business Volume Analysis** - To analyze and compare product features to determine optimal product design in terms of competitive positioning, sales, medical loss, operations, and member or provider satisfaction. With deep product awareness at your fingertips, you can respond promptly to changes in the market place by modifying product design and life cycle.

**Product Development Expense Analysis** - Analysis of the key performance indicators for the product development processes, to improve profit margin.

**Product Development KPI For Growth Analysis** - Analysis of the key performance indicators for the product development processes, to grow revenue.

**Product Development Optimization Analysis** - Analysis of the key performance indicators for the product development processes, to optimize capital efficiency and manage enterprise risk.

**Product Line Analysis** - The analysis of the profitability of health plan products, based on the gross profit obtained by comparing the premium and claim amounts along with the membership stratification across product line and member characteristics.

## Profitability

To evaluate the various contributions to profit of the Health Plan Organization based upon net attributable income and expense, allowing for risk, reserve and outstanding claim considerations. Keeping information about your products and services regarding the costs incurred and the revenues generated will enable detailed analysis on the amount of profitability and the reason for the profitability for the Health Plan Organization.

**Business Activity Performance Analysis** - Analysis of the effectiveness and efficiency that the health plan achieves in performing its business activities.

**Health Plan Operational Cost Analysis** - The analysis of the costs incurred by the health plan during business operations.

**Health Plan Profitability Analysis** - Analysis of key performance indicators of the health plan's profitability.

## Provider Performance & Quality

To determine the success of the Health Plan in meeting industry and customer quality criteria in regard to medical service delivery. Analysis includes the conformance of contracted providers to evidence-based protocols, care guidelines, and drug formularies may be used to support Pay for Performance 'P4P' programs

**Adult Preventative and Diagnostic Care Quality Analysis** - The analysis of the effectiveness of preventive and screening care given adult members by the health plan's healthcare providers during a specific measurement period.

**Behavioral Healthcare Quality Analysis** - The analysis of the effectiveness of care delivered to adult and child members with behavioral health conditions during a specific analysis period.

**Cardiovascular Care Quality Analysis** - The analysis of the effectiveness of care delivered to members with cardiovascular conditions during a specific analysis period.

**Diabetes Care Quality Analysis** - The analysis of the effectiveness of care delivered to members with diabetes during a specific analysis period.

**Elderly Preventative and Diagnostic Care Quality Analysis** - The analysis of elderly specific care delivered to members by the health plan's Primary care provider s.

**Hospital Heart Attack Care Quality Analysis** - The analysis of the treatment of heart attack patients in hospitals. This allows the health plan to determine how quality of care varies across hospitals by geography, size of hospital, quality of medical records, and member age and gender.

**Hospital Heart Failure Care Quality Analysis** - The analysis of the quality of care given in the hospital to heart failure patients.

**Hospital Patient Safety Analysis** - The analysis of patient safety incidents in hospitals. Examining a small number of key indicators adjusted for risk in terms of the complexity and severity of illness in the hospital's patients, can give the health plan insight into the overall level of patient safety at a hospital. Additional dimensions allow the health plan to look at correlations of patient safety with factors such as size, use of electronic medical records, medical records quality, and compliance with evidence based medicine guidelines.

**Hospital Pneumonia Care Quality Analysis** - The analysis of the quality of care given in the hospital to pneumonia patients.

**Hospital Surgical Infection Prevention Analysis** - The analysis of the surgical infection prevention practices in a hospital.

**Institutional Provider Quality Analysis** - The analysis of the overall performance of the health plan's institutional providers, including outcomes, care and administrative quality, communications and innovation in patient care and consumer-driven initiatives. A wide variety of dimensions allow the health plan to easily correlate many different factors to better understand the impact of these factors on performance measures. These insights can then be used to tune the networks, or to develop appropriate provider and provider staff training. Provider performance analysis is also relevant to marketing and sales, which depend on the quality of the plan's providers.

**Medical Error Analysis** - The analysis of medical errors to determine the types causes and the situations in which they occur, and the number and variation in the occurrence of medical errors by provider, by provider type, geography and specialty. Additional dimensions allow the health plan to look at correlations of medical errors with factors such as size, use of electronic medical records, medical records quality, and compliance with evidence based medicine guidelines.

**Member Medication Management Quality Analysis** - The analysis of how successfully healthcare providers are managing the medication of adult and elderly members..

**Member Wellness Analysis** - The analysis of the effectiveness of overall member healthcare management during a specific analysis period.

**Musculoskeletal Care Quality Analysis** - The analysis of the effectiveness of care delivered to members with musculoskeletal conditions during a specific analysis period.

**Pediatric Preventative and Diagnostic Care Quality Analysis** - The analysis of the quality of care given to infants, children and adolescents, by the health plan's Healthcare provider s.

**Prenatal Care Quality Analysis** - The analysis of the quality of prenatal care given expectant mothers by health plan providers, during a specific period of analysis.

**Professional Provider Quality Analysis** - The analysis of the overall performance of the health plan's physicians and physician groups, including outcomes, care and administrative quality, innovation in patient care, communication, and consumer-driven initiatives. A wide variety of dimensions allow the health plan to easily correlate many different factors to better understand the impact of these factors on performance measures. These insights can then be used to tune the networks, or to develop appropriate provider and provider staff training. Provider performance analysis can also be used for marketing and sales, which depend on the quality of the plan's providers.

**Respiratory Care Quality Analysis** - The analysis of the effectiveness of care delivered to members with respiratory conditions during a specific analysis period.

## Retail Sales

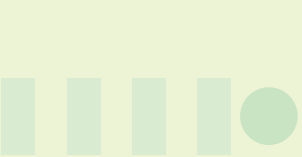
To analyze sales of Individual Healthcare Policies (non-Employer Healthcare Policies) as well as the sale of policies to eligible employees within sponsors (employers), to determine the effectiveness of sales campaigns. This also includes the ability to profile the buyers versus the non-buyers to identify potential adverse selection.

**Business Volume Analysis** - The business volume analysis records measures related to written premium. This analysis can be used to look at the business volume across a company's portfolio.

**Cross-sell Strategy Analysis** - Cross-selling strategy analysis is used to identify optimal cross-sell marketing strategies by comparing estimated potential revenue that would be generated by alternative strategies.

**Cross-selling Forecasting Analysis** - Analyzes factors related to the probability of success for a targeted customer, as well as the premium, acquisition cost and discounted profit associated with a cross-sold policy. For example, this may be used to forecast performance of targeted marketing campaigns, using the customer segments identified by the data mining algorithms and the propensity to cross-buy scores for a typical customer.

**Sales And Distribution Expense Analysis** - Analysis of the key performance indicators for expenses related to the sales and distribution processes, to improve profit margin.



**Sales And Distribution KPI For Growth Analysis** - Analysis of the key performance indicators for the sales and distribution processes to increase revenue and market share.

**Sales And Distribution Optimization Analysis** - Analysis of the key performance indicators for the sales and distribution processes to optimize efficiency and effectiveness.

**Sales Forecast Analysis** - The analysis and comparison of market and company forecasted measures, in terms of policy volumes, premium income, market share and growth rate.

**Sales Performance Analysis** - The sales performance of the healthcare insurance is analyzed by comparing the planned sales volumes and premiums to their corresponding actual numbers and amounts.

## Underwriting

To analyze products, features, return on investment and risk factors that impact underwriting decisions for a product or group.

**Risk Pricing Analysis** - The analysis of risks taken on by the health plan and the revenue generated from those risks.

**Underwriting Efficiency Analysis** - The analysis of the key performance indicators for underwriting activities and their impact on health plan revenue growth.

**Underwriting Resource Utilization Analysis** - The analysis of health plan resource utilization related to underwriting processes and activities.

## Utilization Management

To analyze the medical utilization of members in order to identify potential areas for utilization management programs, the effectiveness of existing utilization management programs and to understand trends in member medical costs. This enables the health plan to project medical costs more accurately and to enhance reporting to group sponsors and providers.

**Ambulatory Care Utilization Analysis** - The analysis of the utilization of ambulatory care services, during the period of analysis. This helps to monitor the increasing trend to relocate previously delivered inpatient services in outpatient settings.

**Chemical Dependency Utilization Analysis** - The analysis of utilization resulting from inpatient, intensive outpatient, partial hospitalization, non-acute outpatient and emergency department (ED) chemical dependency services.

**Inpatient Care Utilization Analysis** - The analysis of both acute inpatient utilization including general medical, surgical, and maternity related admissions as well as non-acute inpatient stays such as hospice, nursing home, rehab, SNF, respite or other transitional care facilities, during the period of analysis.

**Maternity Utilization Analysis** - Analysis of maternity utilization helps the health plan to determine if the average maternity length of stay and types of maternity services (e.g. C-sections) are appropriate. This is important in assessing the quality of maternity care as well as utilization.

**Medical Service Utilization Analysis** - Analysis of utilization detail allows drill downs on specific aspects of utilization and medical costs. As a result of such analysis, the health plan may undertake member and/or provider education, initiate public health or health management programs, or take other actions to control utilization and costs.

**Mental Health Utilization Analysis** - The analysis of utilization resulting from inpatient, intensive outpatient, partial hospitalization, non-acute outpatient and emergency department (ED) mental health services during a specific analysis period.

**Referrals And Authorizations Analysis** - Analysis of referrals and authorizations, considering reasons as well as member and provider characteristics. This analysis enables the health plan to identify opportunities for modifying its referral and authorization rules to improve efficiency and effectiveness.

**Selected Surgical Procedure Utilization Analysis** - The analysis of selected, frequently performed procedures that often show significant utilization variation and potentially inappropriate utilization.

**Utilization Detail Analysis** - Analysis of utilization detail allows drill downs on specific aspects of utilization and medical costs. As a result of such analysis, the health plan may undertake member and/or provider education, initiate public health or health management programs, or take other actions to control utilization and costs.



## US Standards and Regulations

To support US communication standards and reporting regulation.

### HEDIS 2009 ®

The Healthcare Effectiveness and Information Set (HEDIS®) is one of the most widely used sets of healthcare performance measures in the United States. It is developed and maintained by the National Committee for Quality Assurance (NCQA), a not-for-profit organisation committed to assessing, reporting on and improving the quality of healthcare.

**HEDIS Access/Availability of Care Support** - A collection of the HPDM Requirements Model Elements that support the HEDIS 2009 Access/Availability of Care Metrics.

**HEDIS Cost of Care Support** - A collection of the HPDM Requirements Model Elements that support the HEDIS 2009 Cost of Care Metrics.

**HEDIS Effectiveness of Care Support** - A collection of the HPDM Requirements Model Elements that support the HEDIS 2009 Effectiveness of Care Metrics.

**HEDIS Health Plan Descriptive Information Support** - A collection of the HPDM Requirements Model Elements that support the HEDIS 2009 Health Plan Descriptive Metrics.

**HEDIS Health Plan Stability Support** - A collection of the HPDM Requirements Model Elements that support the HEDIS 2009 Health Plan Stability Metrics.

**HEDIS Satisfaction with Experience of Care Support** - A collection of the HPDM Requirements Model Elements that support the HEDIS 2009 Satisfaction with Experience of Care Metrics.

**HEDIS Use of Services Support** - A collection of the HPDM Requirements Model Elements that support the HEDIS 2009 Use of Services Metrics.

### HIPAA Transaction Standards

The Administrative Simplification provisions of the Health Insurance Portability and Accountability Act of 1996 (HIPAA, Title II) required the United States Department of Health and Human Services (HHS) to establish national standards for electronic health care transactions and national identifiers for providers, health plans, and employers. It also addressed the security and privacy of health data.

The Health Plan Data Model supports both HIPAA 4010 and 5010 implementations. The following descriptions relate to the 5010 implementation.

**HIPAA 5010 270 Health Care Eligibility Benefit Inquiry** - Encapsulates all of the data terms used in the "ANSI ASC X12.281 - Eligibility, Coverage, or Benefit Inquiry (270)" Electronic Data Interchange transaction under HIPAA.

**HIPAA 5010 271 Health Care Eligibility Benefit Inquiry Response** - Encapsulates all of the data terms used in the "ANSI ASC X12.282 - Eligibility, Coverage, or Benefit Information (271)" Electronic Data Interchange transaction under HIPAA.

**HIPAA 5010 276 Health Care Claim Status Request** - Encapsulates all of the data terms used in the "ANSI ASC X12.316 Health Care Claim Status Request (276)" Electronic Data Interchange transaction under HIPAA.

**HIPAA 5010 277 Health Care Claim Status Response** - Encapsulates all of the data terms used in the "ANSI ASC X12.317 Health Care Claim Status Response (277)" Electronic Data Interchange transaction under HIPAA.

**HIPAA 5010 278 Health Care Services Review Request: Referral Certification and Authorization - Dental, Professional, Institutional** - Encapsulates all of the data terms used in the "ANSI ASC X12.336, Health Care Service Review Information (278)" Electronic Data Interchange transaction under HIPAA. The transaction provides request facilities for a dialogue between a healthcare provider and a utilisation management organisation related to a request for an ongoing status of a service review.

**HIPAA 5010 278 Health Care Services Review Response: Referral Certification and Authorization - Dental, Professional, Institutional** - Encapsulates all of the data terms used in the "ANSI ASC X12.336, Health Care Service Review Information (278)" Electronic Data Interchange transaction under HIPAA. The transaction provides response facilities for a dialogue between a healthcare provider and a utilisation management organisation related to a request for an ongoing status of a service review.

**HIPAA 5010 820 Payroll Deducted and Other Group Premium Payment for Insurance Products** - Encapsulates all of the data terms used in the "ANSI ASC X12 Premium Payment Order/Remittance Advice (820)" Electronic Data Interchange transaction under HIPAA.

**HIPAA 5010 834 Benefit Enrollment and Maintenance** - A collection of the data elements used to transfer enrollment information from the sponsor of the insurance coverage, benefits, or policy to a payer under the “ANSI ASC X12.84, Benefit Enrollment and Maintenance (834)” transaction.

**HIPAA 5010 835 Health Care Claim Payment/Advice** - Encapsulates all of the data terms used in the “ANSI ASC X12.85, Health Care Claim Payment/Advice (835)” Electronic Data Interchange transaction under HIPAA.

**HIPAA 5010 837 Health Care Claim and Coordination of Benefits: Dental** - Encapsulates all of the data terms used in the “ANSI ASC X12N 837 Health Care Claims (837)” transaction Electronic Data Interchange as applied to dental claims and encounters under HIPAA.

**HIPAA 5010 837 Health Care Claim and Coordination of Benefits: Institutional** - Encapsulates all of the data terms used in the “ANSI ASC X12N 837 Health Care Claims (837)” transaction Electronic Data Interchange as applied to claims and encounters in respect of the services of an individual healthcare Institutional Provider under HIPAA.

**HIPAA 5010 837 Health Care Claim and Coordination of Benefits: Professional** - Encapsulates all of the data terms used in the “ANSI ASC X12N 837 Health Care Claims (837)” transaction Electronic Data Interchange as applied to claims and encounters in respect of the services of an individual healthcare Professional Provider under HIPAA.

**NCPDP Batch Standard Version 1.2-** The National Council for Prescription Drug Programs (NCPDP) Batch Transaction Format provides practical guidelines and ensures consistent implementation throughout the industry of a file submission standard containing claims from multiple pharmacies at a centralized site to multiple processors via a switch or otherwise.

**NCPDP Medicaid Subrogation Request 3.0-** The inbound set of data elements identified for Medicaid Subrogation. These data elements are sourced from the HIPAA 5010 NCPDP Telecommunication Standard Version D.0 message format.

**NCPDP Medicaid Subrogation Response 3.0-** The outbound set of data elements identified for Medicaid Subrogation. These data elements are sourced from the HIPAA 5010 NCPDP Telecommunication Standard Version D.0 message format.

**NCPDP Telecommunication Standard Version D.0** - The National Council for Prescription Drug Programs (NCPDP) promotes the use of a standardized format for electronic communication of claims and other transactions between pharmacy providers, insurance carriers, third-party administrators, and other responsible parties. This standard addresses the data format and content, the transmission protocol, and other appropriate telecommunication requirements.





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**IBM Industry Models**

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