**What is a Formulary and Formulary ID?**

A **formulary** is a list of prescription drugs covered or preferred by a health insurance plan or a healthcare system. It includes both brand-name and generic drugs and is created by a committee based on factors such as drug efficacy, safety, and cost-effectiveness. Formularies are typically organized into tiers that affect the copayment required from patients. A **formulary ID** is a unique identifier assigned to each formulary, distinguishing different formularies used by various insurance plans or contracts. Plans submit formularies with drugs identified by standard codes like RXCUIs (drug identifiers).[wikipedia+2](https://en.wikipedia.org/wiki/Formulary_(pharmacy))​

**Drug Tiers in Formularies**

Drugs in a formulary are classified into tiers (commonly 3 to 5 tiers), which determine the cost-sharing levels for patients:

* **Tier 1**: Usually low-cost generic drugs with the lowest copay.
* **Tier 2**: Preferred brand-name or some nonpreferred generics at a moderate copay.
* **Tier 3**: Nonpreferred or higher-cost brand-name drugs with higher copays.
* **Tier 4 and 5**: Specialty or very high-cost drugs with the highest copays.  
  These tiers reflect both drug cost and therapeutic alternatives, influencing patient and prescriber choices.[goodrx+3](https://www.goodrx.com/insurance/health-insurance/medication-formulary)​

**What Are Drug Plans?**

Drug plans, especially in the US Medicare system, are insurance plans (like Medicare Part D) that cover prescription drugs. Plans contain formularies listing covered drugs and control costs through tiering, prior authorizations, step therapies, and quantity limits. Each plan is identified by contract and plan IDs, linked to formularies, coverage levels, premiums, and deductibles.[healthline+2](https://www.healthline.com/health/medicare/medicare-prescription-plans)​

**How Prices and Tiers Change**

Plans may change drug tiers and copay amounts based on drug price changes by manufacturers, new generic entries, or new clinical information. When cheaper generics become available, brand-name drugs might move to higher tiers, increasing patient cost-sharing. Plans can also add or remove drugs from formularies or modify restrictions like prior authorization (requiring approval before coverage) or step therapy (trying cheaper drugs first).[medicare](https://www.medicare.gov/health-drug-plans/part-d/what-drug-plans-cover/how-drug-plans-work" \t "_blank)​

**How Pharmaceutical Companies Boost Profits**

Pharmaceutical companies increase profits by:

* Targeting market penetration with existing drugs.
* Promoting drugs effectively to prescribers using digital detailing and analytics.
* Monitoring sales data and prescriber patterns to detect underperformance.
* Managing pricing strategies related to tiers and insurance coverage.
* Ensuring drug coverage and preferred tiers in formularies via negotiation with payers.

**DATABASE STRUCTURE:**

Table insulin\_beneficiary\_cost {

  contract\_id varchar

  plan\_id varchar

  segment\_id varchar

  tier varchar

  days\_supply integer

  copay\_amt\_pref\_insln numeric

  copay\_amt\_nonpref\_insln numeric

  copay\_amt\_mail\_pref\_insln numeric

  copay\_amt\_mail\_nonpref\_insln numeric

}

Table geographic\_locator {

  county\_code varchar

  statename varchar

  county varchar

  ma\_region\_code varchar

  ma\_region varchar

  pdp\_region\_code varchar

  pdp\_region varchar

}

Table basic\_drugs\_formulary {

  formulary\_id varchar

  formulary\_version integer

  contract\_year integer

  rxcui integer

  ndc varchar

  tier\_level\_value integer

  quantity\_limit\_yn char

  quantity\_limit\_amount numeric

  quantity\_limit\_days integer

  prior\_authorization\_yn char

  step\_therapy\_yn char

}

Table users {

  id integer [primary key]

  name varchar

  email varchar

  oauth\_provider varchar

  oauth\_id varchar

  profile\_pic\_url varchar

  role varchar

  created\_at timestamp

  updated\_at timestamp

}

Table prescribers\_by\_geography\_drug {

  year integer

  prscrbr\_geo\_lvl varchar

  prscrbr\_geo\_cd varchar

  prscrbr\_geo\_desc varchar

  brnd\_name varchar

  gnrc\_name varchar

  tot\_prscrbrs integer

  tot\_clms integer

  tot\_30day\_fills numeric

  tot\_drug\_cst numeric

  tot\_benes integer

  ge65\_sprsn\_flag char

  ge65\_tot\_clms integer

  ge65\_tot\_30day\_fills numeric

  ge65\_tot\_drug\_cst numeric

  ge65\_bene\_sprsn\_flag char

  ge65\_tot\_benes integer

  lis\_bene\_cst\_shr numeric

  nonlis\_bene\_cst\_shr numeric

  opioid\_drug\_flag char

  opioid\_la\_drug\_flag char

  antbtc\_drug\_flag char

  antpsyct\_drug\_flag char

}

Table beneficiary\_cost {

  contract\_id varchar

  plan\_id varchar

  segment\_id varchar

  coverage\_level integer

  tier integer

  days\_supply integer

  cost\_type\_pref integer

  cost\_amt\_pref numeric

  cost\_min\_amt\_pref numeric

  cost\_max\_amt\_pref numeric

  cost\_type\_nonpref integer

  cost\_amt\_nonpref numeric

  cost\_min\_amt\_nonpref numeric

  cost\_max\_amt\_nonpref numeric

  cost\_type\_mail\_pref integer

  cost\_amt\_mail\_pref numeric

  cost\_min\_amt\_mail\_pref numeric

  cost\_max\_amt\_mail\_pref numeric

  cost\_type\_mail\_nonpref integer

  cost\_amt\_mail\_nonpref numeric

  cost\_min\_amt\_mail\_nonpref numeric

  cost\_max\_amt\_mail\_nonpref numeric

  tier\_specialty\_yn char

  ded\_applies\_yn char

}

Table plan\_info {

  contract\_id varchar

  plan\_id varchar

  segment\_id varchar

  contract\_name varchar

  plan\_name varchar

  formulary\_id varchar

  premium numeric

  deductible integer

  ma\_region\_code varchar

  pdp\_region\_code varchar

  state char

  county\_code varchar

  snp integer

  plan\_suppressed\_yn char

}

Table excluded\_drugs\_formulary {

  contract\_id varchar

  plan\_id varchar

  rxcui integer

  tier integer

  quantity\_limit\_yn char

  quantity\_limit\_amount integer

  quantity\_limit\_days integer

  prior\_auth\_yn char

  step\_therapy\_yn char

  capped\_benefit\_yn char

}

Table indication\_based\_coverage\_formulary {

  contract\_id varchar

  plan\_id varchar

  rxcui bigint

  disease text

}

Ref: "plan\_info"."ma\_region\_code" < "geographic\_locator"."ma\_region\_code"

Ref: "plan\_info"."pdp\_region\_code" < "geographic\_locator"."pdp\_region\_code"

Ref: "plan\_info"."county\_code" < "geographic\_locator"."county\_code"

Ref: "plan\_info"."formulary\_id" < "basic\_drugs\_formulary"."formulary\_id"

Ref: "plan\_info"."contract\_id" < "beneficiary\_cost"."contract\_id"

Ref: "plan\_info"."plan\_id" < "beneficiary\_cost"."plan\_id"

Ref: "plan\_info"."segment\_id" < "beneficiary\_cost"."segment\_id"

Ref: "plan\_info"."contract\_id" < "excluded\_drugs\_formulary"."contract\_id"

Ref: "plan\_info"."plan\_id" < "excluded\_drugs\_formulary"."plan\_id"

Ref: "plan\_info"."contract\_id" < "indication\_based\_coverage\_formulary"."contract\_id"

Ref: "plan\_info"."plan\_id" < "indication\_based\_coverage\_formulary"."plan\_id"

Ref: "excluded\_drugs\_formulary"."tier" < "beneficiary\_cost"."tier"

Ref: "beneficiary\_cost"."contract\_id" < "excluded\_drugs\_formulary"."contract\_id"

Ref: "beneficiary\_cost"."plan\_id" < "excluded\_drugs\_formulary"."plan\_id"

Ref: "plan\_info"."contract\_id" < "insulin\_beneficiary\_cost"."contract\_id"

Ref: "plan\_info"."plan\_id" < "insulin\_beneficiary\_cost"."plan\_id"

Ref: "plan\_info"."segment\_id" < "insulin\_beneficiary\_cost"."segment\_id"

Ref: "basic\_drugs\_formulary"."tier\_level\_value" < "insulin\_beneficiary\_cost"."tier"

Ref: "basic\_drugs\_formulary"."tier\_level\_value" < "beneficiary\_cost"."tier"

Ref: "insulin\_beneficiary\_cost"."contract\_id" < "beneficiary\_cost"."contract\_id"

Ref: "insulin\_beneficiary\_cost"."plan\_id" < "beneficiary\_cost"."plan\_id"

Ref: "insulin\_beneficiary\_cost"."segment\_id" < "beneficiary\_cost"."segment\_id"

Ref: "insulin\_beneficiary\_cost"."tier" < "beneficiary\_cost"."tier"

Ref: "basic\_drugs\_formulary"."rxcui" < "indication\_based\_coverage\_formulary"."rxcui"

Ref: "indication\_based\_coverage\_formulary"."contract\_id" < "excluded\_drugs\_formulary"."contract\_id"

Ref: "indication\_based\_coverage\_formulary"."plan\_id" < "excluded\_drugs\_formulary"."plan\_id"