# HealthData API Overview

HealthData API provides programmatic access to IHME data.

HealthData API is currently in beta, available only to select external users. Performance, accuracy, and uptime are not guaranteed. Data and use are subject to standard IHME terms and conditions. All requests require a valid authorization key.

HealthData API’s root endpoint is <https://api.healthdata.org/healthdata/v2/>.

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## Section 1: HealthData API Requests and Responses

HealthData API is a RESTful API. Requests and responses use the HTTP GET method.

### Section 1.1: Requests

HealthData API requests are made through query strings appended to URLs. These query strings are divided into parameters and values.

Some parameters are shared across many endpoints. These are:

* **authorization**: identifies valid HealthData API user. **Required**.
* **object**: transforms the response data array into an array of objects when set to “true”.
* **readable**: appends human-readable fields to the response data array when set to “true”.

All other parameters are endpoint-specific.

### Section 1.2: Responses

HealthData API responses are JSON objects. These objects have this structure:

* **meta** (object): information about request and response.
  + **status** (object): information about request status.
    - **code** (string): HealthData API status code.
    - **message** (string): HealthData API status message.
  + **notes** (string): general HealthData API notes.
  + **time** (object): information about request response time.
    - **db** (string): database query time.
    - **api** (string): API response generation time.
  + **additional** (string): indicator if request contained more rows than are in response.
  + **row\_count** (number): number of rows in response
  + **fields** (array): array of field names for estimates in data object.
    - **element** (string): field name.
* **data** (array): collection of specific IHME estimates returned by the endpoint’s filters.
  + **element** (array or object): collection of fields corresponding to a specific estimate.
    - **element** (string):value for a particular estimate’s field.

### Section 1.3: Examples

* Estimated numbers of deaths attributable to HIV (1990, both sexes, all ages, United States) (condensed):
  + **Request:** https://api.healtvhdata.org/healthdata/v2/data/gbd/2017/cause/?measure\_id=1&age\_group\_id=22&location\_id=102&year\_id=1990&cause\_id=298&sex\_id=3&metric\_id=1&authorization=YOUR\_AUTHORIZATION\_KEY
  + **Response:** {"meta":{"status":{"code":"200","message":"OK"},"notes":{"warning":"This API is in alpha testing. Performance, uptime, and accuracy are not guaranteed. Data and use are subject to standard IHME terms and conditions.","time":{"db":"0.48368638","api":0.016649551777954}},"row\_count":1,"additional":false,"fields":["measure\_id","year\_id","location\_id","sex\_id","age\_group\_id","cause\_id","metric\_id","val","upper","lower"]},"data":[["1","1990","102","3","22","298","1","27345.3055782","27627.8914306","27080.4057016"]]}
* Estimated numbers of deaths attributable to HIV (1990, both sexes, all ages, United States) (readable, with object set to true):
  + **Request:** https://api.healthdata.org/healthdata/v2/data/gbd/2017/cause/?measure\_id=1&age\_group\_id=22&location\_id=102&year\_id=1990&cause\_id=298&sex\_id=3&metric\_id=1&readable=true&object=true&authorization=YOUR\_AUTHORIZATION\_KEY
  + **Response:** {"meta":{"status":{"code":"200","message":"OK"},"notes":{"warning":"This API is in alpha testing. Performance, uptime, and accuracy are not guaranteed. Data and use are subject to standard IHME terms and conditions.","time":{"db":"0.62969138","api":0.015909654164429}},"row\_count":1,"additional":false,"fields":["measure\_id","measure\_name","year\_id","year\_name","location\_id","location\_name","sex\_id","sex","age\_group\_id","age\_group\_name","cause\_id","cause\_name","metric\_id","metric\_name","val","upper","lower"]},"data":[{"measure\_id":"1","measure\_name":"Deaths","year\_id":"1990","year\_name":"1990","location\_id":"102","location\_name":"United States","sex\_id":"3","sex":"Both","age\_group\_id":"22","age\_group\_name":"All Ages","cause\_id":"298","cause\_name":"HIV\/AIDS","metric\_id":"1","metric\_name":"Number","val":"27345.3055782","upper":"27627.8914306","lower":"27080.4057016"}]}

## Section 2: HealthData API Endpoints Overview

HealthData API has two categories of active endpoints: metadata endpoints and data endpoints.

* **Metadata endpoints** contain information about parameters used by HealthData API and IHME. Metadata endpoint values can be used to construct valid API requests and decipher API responses.
* **Data endpoints** contain IHME data, including estimates provided by GBD 2017. They can be queried using values from the metadata endpoints.

### Section 2.1: Differences Between Version 1 and Version 2

HealthData API’s current version is version 2. Version 2 can be accessed through the “v2” resource in API requests (compared with version 1’s “v1” resource).

HealthData API version 2 allows users access to more focused data: GBD 2016 data, GBD 2017 data, Forecasting 2016 data, 2015 USA subnational data, and select metadata endpoints. Support for GHDx endpoints is not currently enabled, but will likely be added.

HealthData API version 1 is deprecated. Support will be removed by the end of 2019.

## Section 3: Selected Metadata Endpoints

This section contains information about selected HealthData API metadata endpoints. These endpoints link HealthData API concepts to their associated ID numbers. These ID numbers can be used to request data from HealthData API data endpoints (section 4). Metadata endpoints discussed in this section are:

1. age\_group
2. cause
3. etiology
4. impairment
5. location
6. measure
7. metric
8. risk
9. scenario
10. sex
11. year

### 3.1: age\_group

* <https://api.healthdata.org/healthdata/v2/metadata/age_group/>
* Contains information about age groups used in IHME estimates. Age groups are ranges of ages associated with these estimates.
* Example: age\_group\_id “22” is the “All Ages” age group.
* Valid parameters:
  + age\_group\_set\_id
  + age\_group\_id

### 3.2: cause

* <https://api.healthdata.org/healthdata/v2/metadata/cause/>
* Contains information about causes used in IHME estimates. Causes are causes of death, disability, impairment, or injury. They are grouped hierarchically.
* Example: cause\_id “298” is the “HIV/AIDS” cause.
* Valid parameters:
  + cause\_id
  + cause\_set\_id
  + gbd\_round

### 3.3: etiology

* <https://api.healthdata.org/healthdata/v2/metadata/etiology/>
* Contains information about etiologies used in IHME estimates. Etiologies are causes of a particular cause of death, disability, or impairment. They are grouped hierarchically.
* Example: etiology\_id “183” is the “Clostridium difficile” etiology for the “diarrhea” cause.
* Valid parameters:
  + etiology\_id
  + etiology\_set\_id
  + gbd\_round

### 3.4: impairment

* <https://api.healthdata.org/healthdata/v2/metadata/impairment/>
* Contains information about impairments used in IHME estimates. Impairments are particular health condition associated with a particular cause. They are grouped hierarchically.
* Example: impairment\_id “208” is the “Treated epilepsy” impairment.
* Valid parameters:
  + impairment\_id
  + impairment\_set\_id
  + gbd\_round

### 3.5: location

* <https://api.healthdata.org/healthdata/v2/metadata/location/>
* Contains information about locations used in IHME estimates. Locations are geographically-based political entities associated with these estimates. They are grouped hierarchically.
* Example: location\_id “102” is the “United States” location.
* Valid parameters:
  + location\_id
  + location\_set\_id
  + gbd\_round

### 3.6: measure

* <https://api.healthdata.org/healthdata/v2/metadata/measure/>
* Contains information about measures used in IHME estimates. Measures are observed quantities associated with these estimates.
* Example: measure\_id “1” is the “Deaths” measure.
* Valid parameters:
  + measure\_id

### 3.7: metric

* <https://api.healthdata.org/healthdata/v2/metadata/metric/>
* Contains information about metrics used in IHME estimates. Metrics are units of measure for observed quantities associated with these estimates.
* Example: metric\_id “1” is the “Number” metric.
* Valid parameters:
  + metric\_id

### 3.8: risk

* <https://api.healthdata.org/healthdata/v2/metadata/risk/>
* Contains information about risks used in IHME estimates. Risks are contributing factors to causes of death, injury, or impairment. They are grouped hierarchically.
* Example: risk\_id “91” is the “Lead exposure” risk.
* Valid parameters:
  + risk\_id
  + risk\_set\_id
  + gbd\_round

### 3.9: scenario

* <https://api.healthdata.org/healthdata/v2/metadata/scenario/>
* Contains information about scenarios used in IHME Forecasting estimates.
* Example: scenario\_id “1” is “Default.”
* Valid parameters:
  + scenario\_id

### 3.10: sex

* <https://api.healthdata.org/healthdata/v2/metadata/sex/>
* Contains information about sexes used in IHME estimates.
* Example: sex\_id “3” is “Both sexes.”
* Valid parameters:
  + sex\_id

### 3.11: year

* <https://api.healthdata.org/healthdata/v2/metadata/year/>
* Contains information about years used in IHME estimates.
* Example: year\_id “1990” is the year 1990.
* Valid parameters:
  + year\_id

## Section 4: Data Endpoints

This section contains information about HealthData API data endpoints. These endpoints contain actual IHME data. They are grouped hierarchically by research project. Currently, only three research projects have data endpoints: GBD 2017, GBD 2016, and the USA Subnational (or US Health Map) project.

Though they contain similar estimates, these are separate projects. GBD contains more recent and comprehensive estimates, but only at the national and state levels for the United States. USA Subnational contains sparser and older estimates, but at the national, state, and county levels.

For more detailed information about valid parameters and values for each data endpoint, see the spreadsheet associated with this overview.

### Section 4.1: GBD 2017 Endpoints

These endpoints contain estimates from GBD 2017. The endpoints are divided by context. Each context requires a unique combination of parameters and returns a unique combination of fields. There are seven publicly released GBD 2017 endpoints:

1. cause:
2. etiology:
3. impairment:
4. population
5. risk
6. sequela
7. sev

Additionally, each GBD 2017 endpoint is divided into “single” and “multi” endpoints. “single” endpoints contain estimates for a single year; “multi” endpoints contain estimates for changes between years.

All parameters and fields are the same between these two types of endpoints, except that “year\_id” in the “single” context is replaced with “year\_start\_id” and “year\_end\_id” in the “multi” context.

#### 4.1.1: cause

* <https://api.healthdata.org/healthdata/v2/data/gbd/2017/cause/single/>
* Contains GBD 2017 estimates for specific causes of death, disability, and impairment.
* Requires at least five specified parameters, one of which must be measure\_id.
* Valid parameters:
  + age\_group\_id
  + location\_id
  + measure\_id
  + metric\_id
  + sex\_id
  + year\_id
  + cause\_id

#### 4.1.2: etiology

* <https://api.healthdata.org/healthdata/v2/data/gbd/2017/etiology/single/>
* Contains GBD 2017 estimates for specific cause/etiology pairs.
* Requires at least six specified parameters, one of which must be measure\_id.
* Valid parameters:
  + age\_group\_id
  + location\_id
  + measure\_id
  + metric\_id
  + sex\_id
  + year\_id
  + cause\_id
  + etiology\_id

#### 4.1.3: impairment

* <https://api.healthdata.org/healthdata/v2/data/gbd/2017/impairment/single/>
* Contains GBD 2017 estimates for specific cause/impairment pairs.
* Requires at least six specified parameters, one of which must be measure\_id.
* Valid parameters:
  + age\_group\_id
  + location\_id
  + measure\_id
  + metric\_id
  + sex\_id
  + year\_id
  + cause\_id
  + impairment\_id

#### 4.1.4: population

* <https://api.healthdata.org/healthdata/v2/data/gbd/2017/population/single/>
* Contains GBD 2017 estimates for specific population-level measures, such as life expectancy.
* Requires at least four specified parameters, one of which must be measure\_id.
* Valid parameters:
  + age\_group\_id
  + location\_id
  + measure\_id
  + metric\_id
  + sex\_id
  + year\_id

#### 4.1.5: risk

* <https://api.healthdata.org/healthdata/v2/data/gbd/2017/risk/single/>
* Contains GBD 2017 estimates for specific cause/risk pairs.
* Requires at least six specified parameters, one of which must be measure\_id.
* Valid parameters:
  + age\_group\_id
  + location\_id
  + measure\_id
  + metric\_id
  + sex\_id
  + year\_id
  + cause\_id
  + risk\_id

#### 4.1.6: sequela

* <https://api.healthdata.org/healthdata/v2/data/gbd/2017/sequela/single/>
* Contains GBD 2017 estimates for specific summary exposure variables.
* Requires at least five specified parameters, one of which must be measure\_id.
* Valid parameters:
  + age\_group\_id
  + location\_id
  + measure\_id
  + metric\_id
  + sex\_id
  + year\_id
  + sequela\_id

#### 4.1.7: sev

* <https://api.healthdata.org/healthdata/v2/data/gbd/2017/sev/single/>
* Contains GBD 2017 estimates for specific summary exposure variables.
* Requires at least five specified parameters, one of which must be measure\_id.
* Valid parameters:
  + age\_group\_id
  + location\_id
  + measure\_id
  + metric\_id
  + sex\_id
  + year\_id
  + risk\_id

### Section 4.2: GBD 2016 Endpoints

GBD 2016 endpoints are identical to GBD 2017 endpoints. The two differences are:

1. The “2017” path resource is replaced by “2016”:
   1. **2016:** <https://api.healthdata.org/healthdata/v2/data/gbd/2016/sev/single/>
   2. **2017:** <https://api.healthdata.org/healthdata/v2/data/gbd/2017/sev/single/>
2. The “sequela” endpoint is disabled. GBD 2016 has not made its sequela-level results publicly accessible enough to make available through this API.

### Section 4.3: Forecasting 2016 Endpoints

These endpoints contain estimates from the Forecasting project based on a version of GBD 2016 data. The endpoints are divided by context. Each context requires a unique combination of parameters and returns a unique combination of fields. There are four publicly released Forecasting 2016 endpoints:

1. cause
2. population
3. risk
4. sev

#### 4.3.1: cause

* <https://api.healthdata.org/healthdata/v2/data/fbd/2016/cause/single/>
* Contains FBD 2016 estimates for specific causes of death, disability, and impairment.
* Requires at least six specified parameters, one of which must be measure\_id.
* Valid parameters:
  + age\_group\_id
  + location\_id
  + measure\_id
  + metric\_id
  + sex\_id
  + year\_id
  + cause\_id
  + scenario\_id

#### 4.3.2: population

* <https://api.healthdata.org/healthdata/v2/data/fbd/2016/population/single/>
* Contains FBD 2016 estimates for specific population-level measures, such as life expectancy.
* Requires at least five specified parameters, one of which must be measure\_id.
* Valid parameters:
  + age\_group\_id
  + location\_id
  + measure\_id
  + metric\_id
  + sex\_id
  + year\_id
  + scenario\_id

#### 4.3.3: risk

* <https://api.healthdata.org/healthdata/v2/data/fbd/2016/risk/single/>
* Contains FBD 2016 estimates for specific cause/risk pairs.
* Requires at least seven specified parameters, one of which must be measure\_id.
* Valid parameters:
  + age\_group\_id
  + location\_id
  + measure\_id
  + metric\_id
  + sex\_id
  + year\_id
  + cause\_id
  + risk\_id
  + scenario\_id

#### 4.3.4: sev

* <https://api.healthdata.org/healthdata/v2/data/fbd/2016/sev/single/>
* Contains GBD 2016 estimates for specific summary exposure variables.
* Requires at least six specified parameters, one of which must be measure\_id.
* Valid parameters:
  + age\_group\_id
  + location\_id
  + measure\_id
  + metric\_id
  + sex\_id
  + year\_id
  + risk\_id
  + scenario\_id

### Section 4.4: USA Subnational 2015 Endpoints

These endpoints contain estimates from IHME’s USA Subnational project. The endpoints are divided by context. Each context requires a unique combination of parameters and values. Most return a unique combination of fields. There are three publicly released USA Subnational endpoints:

1. life-expectancy
2. mortality-rate
3. mortality-risk

#### 4.4.1: life-expectancy

* <https://api.healthdata.org/healthdata/v2/data/subnational/usa/2015/life-expectancy/single/>
* Contains USA Subnational life expectancy estimates.
* Requires at least four specified parameters.
* Valid parameters:
  + age\_group\_id
  + location\_id
  + measure\_id
  + metric\_id
  + sex\_id
  + year\_id

#### 4.4.2: mortality-rate

* <https://api.healthdata.org/healthdata/v2/data/subnational/usa/2015/mortality-rate/single/>
* Contains USA Subnational cause-specific mortality rate estimates.
* Requires at least five specified parameters.
* Valid parameters:
  + age\_group\_id
  + location\_id
  + measure\_id
  + metric\_id
  + sex\_id
  + year\_id
  + cause\_id

#### 4.4.3: mortality-risk

* <https://api.healthdata.org/healthdata/v2/data/subnational/usa/2015/mortality-risk/single/>
* Contains USA Subnational mortality risk estimates.
* Requires at least four specified parameters.
* Valid parameters:
  + age\_group\_id
  + location\_id
  + measure\_id
  + metric\_id
  + sex\_id
  + year\_id