# NV-HAP Data Spec

## Document History

|  |  |  |  |
| --- | --- | --- | --- |
| Version | Date | Author | Change Status |
| 1.3 | 04/12/2021 | Cara McKenna | Added route mapped values. route\_1 - route\_7 variables should be mapped to these values. |
| 1.2 | 02/05/2020 | Cara McKenna | Made route\_1 - route\_7 required variables |
| 1.1 | 12/17/2019 | Cara McKenna | Removed principle\_diagnosis\_n. Put all diagnoses in diagnosis\_n  Map missing device to NONE  Added antibiotic route |
| 1.0 | 10/23/2019 | Cara McKenna | Initial Draft |

## About

This document describes the datasets needed to run the NV-HAP detection programs. Two different datasets are needed by the programs:

* An Episode Level File (one row per patient-hospitalization)
* A Daily Level File (one row per patient-day)

The NV-HAP detection programs assume that the input data conform to the specific variable names and attributes as described below. Some variables require mapping in order to limit the number of possible values. For these variables a list of mapped values is given. The minimum necessary variables for NV-HAP event detection are noted in the ‘Currently Used for NV-HAP Detection’ column.

Examples of each file are provided in the Appendix.

## Episode Data

Structure: One record per patient per hospitalization.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **Currently Used for NV-HAP Detection** | **Type** | **Label** | **Values**  (hyperlinks show allowable options for a given variable where appropriate) | **Notes** |
| siteid | ✓ | Char | Site/Hospital Identifier |  | Can be a coded hospital identifier rather than a specific hospital name if preferred. |
| patid | ✓ | Char | Unique patient identifier |  |  |
| gender | ✓ | Char | Gender | [Gender](#gender) | Map from gender. |
| race\_group |  | Char | Race Group | [Race](#race) | Map from race. |
| admission\_date | ✓ | Num | Admission Date |  |  |
| discharge\_date | ✓ | Num | Discharge Date |  |  |
| enc\_age | ✓ | Num | Age in Years on Admission |  |  |
| discharge\_ group | ✓ | Char | Discharge Disposition Grouped | [Discharge Disposition](#dd) | Map from raw discharge disposition |
| enc\_death | ✓ | Num | Patient died during hospital encounter | [0/1](#zero_one) |  |
| date\_of\_death |  | Num | Date of Death |  | Include even if date of death is after the discharge date |
| drg |  | Num | Diagnosis-Related Group (DRG) Code | DRG code |  |
| drg\_code\_type |  | Char | DRG Coding System Used | [DRG](#drg) |  |
| diagnosis\_code\_type |  | Char | Diagnosis Coding System Used | [Diagnosis](#dx) |  |
| admitting\_diagnosis\_*n* |  | Char | Admitting diagnosis *n* | ICD9/10 code | One diagnosis per variable e.g. admitting\_diagnosis \_1, admitting\_diagnosis \_2, etc. |
| diagnosis\_*n* | ✓ | Char | Diagnosis *n* | ICD9/10 code | All discharge diagnoses – principle and secondary . One diagnosis per variable. |

## Daily Data

Structure: One record per patient per calendar day.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **Currently Used for NV-HAP Detection** | **Type** | **Label** | **Values** | **Notes** |
| siteid | ✓ | Char | Site/Hospital Identifier |  | Can be a coded hospital identifier rather than specific hospital name if preferred. |
| patid | ✓ | Char | Unique patient identifier |  | Will link episode data |
| date | ✓ | Num | Date of calendar day |  |  |
| min\_temp |  | Num | Minimum Measured Temperature for Day (F) |  |  |
| max\_temp | ✓ | Num | Maximum Measured Temperature for Day (F) |  |  |
| avg\_temp |  | Num | Average calculated Temperature for Day (F) |  |  |
| med\_temp |  | Num | Median Measured Temperature for Day (F) |  |  |
| n\_temp |  | Num | Count of Measured Temperature Values for Day |  |  |
| min\_resp |  | Num | Minimum Measured Respiratory Rate for Day |  | Count of breaths/min |
| max\_resp |  | Num | Maximum Measured Respiratory Rate for Day |  | Count of breaths/min |
| avg\_resp |  | Num | Average calculated Respiratory Rate for Day |  | Count of breaths/min |
| med\_resp |  | Num | Median Measured Respiratory Rate for Day |  | Count of breaths/min |
| pct10\_resp |  | Num | 10th Percentile Value for Respiratory Rate for Day |  |  |
| pct90\_resp |  | Num | 90th Percentile Value for Respiratory Rate for Day |  |  |
| n\_resp |  | Num | Count of Measured Respiratory Rate Values for Day |  | # of times respiratory rate recorded/day |
| min\_spO2 |  | Num | Minimum Measured Oxygen Saturation Levels for Day |  | Express as value between 0 and 100 |
| max\_spO2 | ✓ | Num | Maximum Measured Oxygen Saturation Levels for Day |  | Express as value between 0 and 100 |
| avg\_spO2 |  | Num | Average calculated Oxygen Saturation Levels for Day |  | Express as value between 0 and 100 |
| med\_spO2 |  | Num | Median Measured Oxygen Saturation Levels for Day |  | Express as value between 0 and 100 |
| pct10\_spO2 |  | Num | 10th Percentile Value for Oxygen Saturation Levels for Day |  | Express as value between 0 and 100 |
| pct90\_spO2 |  | Num | 90th Percentile Value for Oxygen Saturation Levels for Day |  | Express as value between 0 and 100 |
| n\_spO2 |  | Num | Count of Measured Oxygen Saturation Values for Day |  |  |
| min\_fi02 |  | Num | Minimum Measured Fraction of Inspired O2 Levels for Day |  | Express as value between 21 and 100. Default to 21 if missing. |
| max\_fi02 |  | Num | Maximum Measured Fraction of Inspired O2 Levels for Day |  | Express as value between 21 and 100.  Default to 21 if missing. |
| avg\_fi02 |  | Num | Average calculated Fraction of Inspired O2 Levels for Day |  | Express as value between 21 and 100.  Default to 21 if missing. |
| med\_fi02 |  | Num | Median Measured Fraction of Inspired O2 Levels for Day |  | Express as value between 21 and 100.  Default to 21 if missing. |
| pct10\_fiO2 |  | Num | 10th Percentile value for fraction of Inspired O2 Levels for Day |  | Express as value between 21 and 100.  Default to 21 if missing. |
| pct90\_fiO2 |  | Num | 90th Percentile value for fraction of inspired O2 Levels for Day |  | Express as value between 21 and 100.  Default to 21 if missing. |
| n\_fiO2 |  | Num | Count of Measured fraction of inspired O2 Values for Day |  | # of times FiO2 measured per day |
| min\_O2FlRt |  | Num | Minimum Measured Flow Rate for The Highest Supplemental Oxygen Device for Day |  | Use highest supplemental oxygen device- see Appendix for [hierarchy of oxygen delivery devices](#deviceorder) |
| max\_O2FlRt |  | Num | Maximum Measured Flow Rate for The Highest Supplemental Oxygen Device for Day |  | Use highest supplemental oxygen device- see Appendix for [hierarchy of oxygen delivery devices](#deviceorder) |
| avg\_O2FlRt |  | Num | Average calculated Flow Rate for The Highest Supplemental Oxygen Device for Day |  | Use highest supplemental oxygen device- see Appendix for [hierarchy of oxygen delivery devices](#deviceorder) |
| med\_O2FlRt | ✓ | Num | Median Measured Flow Rate for The Highest Supplemental Oxygen Device for Day |  | Use highest supplemental oxygen device- see Appendix for [hierarchy of oxygen delivery devices](#deviceorder) |
| pct10\_O2FlRt |  | Num | 10th Percentile flow rate for the highest supplemental oxygen delivery device for day |  | Use highest supplemental oxygen device- see Appendix for [hierarchy of oxygen delivery devices](#deviceorder) |
| pct90\_O2FlRt |  | Num | 90th Percentile flow rate for the highest supplemental oxygen delivery device for day |  | Use highest supplemental oxygen device- see Appendix for [hierarchy of oxygen delivery devices](#deviceorder) |
| n\_O2FlRt |  | Num | Count of Measured Flow Rate for The Highest Supplemental Oxygen Device Values for Day |  | Number of times oxygen flow rates recorded per day |
| min\_bpSystolic |  | Num | Minimum Measured Systolic Blood Pressure for Day |  |  |
| max\_bpSystolic |  | Num | Maximum Measured Systolic Blood Pressure for Day |  |  |
| avg\_bpSystolic |  | Num | Average Systolic Blood Pressure for Day |  |  |
| med\_bpSystolic |  | Num | Median Systolic Blood Pressure for Day |  |  |
| pct10\_bpSystolic |  | Num | 10th Percentile Systolic Blood Pressure for Day |  |  |
| pct90\_bpSystolic |  | Num | 90th Percentile Systolic Blood Pressure for Day |  |  |
| n\_bpSystolic |  | Num | Count of Measured Systolic Blood Pressure Values for Day |  | # of times systolic BP recorded / day |
| min\_bpDiastolic |  | Num | Minimum Measured Diastolic Blood Pressure for Day |  |  |
| max\_bpDiastolic |  | Num | Maximum Measured Diastolic Blood Pressure for Day |  |  |
| avg\_bpDiastolic |  | Num | Average Diastolic Blood Pressure for Day |  |  |
| med\_bpDiastolic |  | Num | Median Diastolic Blood Pressure for Day |  |  |
| pct10\_bpDiastolic |  | Num | 10th Percentile Diastolic Blood Pressure for Day |  |  |
| pct90\_bpDiastolic |  | Num | 90th Percentile Diastolic Blood Pressure for Day |  |  |
| n\_bpDiastolic |  | Num | Count of Measured Diastolic Blood Pressure Values for Day |  | # of times diastolic BP recorded / day |
| min\_HR |  | Num | Minimum Measured Heart Rate for Day |  |  |
| max\_HR |  | Num | Maximum Measured Heart Rate for Day |  |  |
| avg\_HR |  | Num | Average Measured Heart Rate for Day |  |  |
| med\_HR |  | Num | Median Measured Heart Rate for Day |  |  |
| pct10\_HR |  | Num | 10th Percentile Value of all measured heart rates for day |  |  |
| pct90\_HR |  | Num | 90th Percentile Value of all measured heart rates for day |  |  |
| n\_ HR |  | Num | Count of Measured Heart Rate Values for Day |  | # of times HR recorded / day |
| antibiotic\_1 | ✓ | Char | Antibiotic 1 |  |  |
| route\_1 | ✓ | Char | Antibiotic Route 1 | [route](#route) | Map to values listed under route mapping |
| indication\_1 |  | Char | Antibiotic Indication 1 |  |  |
| antibiotic\_2 | ✓ | Char | Antibiotic 2 |  |  |
| route\_2 | ✓ | Char | Antibiotic Route 2 | [route](#route) | Map to values listed under route mapping |
| indication\_2 |  | Char | Antibiotic Indication 2 |  |  |
| antibiotic\_3 | ✓ | Char | Antibiotic 3 |  |  |
| route\_3 | ✓ | Char | Antibiotic Route 3 | [route](#route) | Map to values listed under route mapping |
| indication\_3 |  | Char | Antibiotic Indication 3 |  |  |
| antibiotic\_4 | ✓ | Char | Antibiotic 4 |  |  |
| route\_4 | ✓ | Char | Antibiotic Route 4 | [route](#route) | Map to values listed under route mapping |
| indication\_4 |  | Char | Antibiotic Indication 4 |  |  |
| antibiotic\_5 | ✓ | Char | Antibiotic 5 |  |  |
| route\_5 | ✓ | Char | Antibiotic Route 5 | [route](#route) | Map to values listed under route mapping |
| indication\_5 |  | Char | Antibiotic Indication 5 |  |  |
| antibiotic\_6 | ✓ | Char | Antibiotic 6 |  |  |
| route\_6 | ✓ | Char | Antibiotic Route 6 | [route](#route) | Map to values listed under route mapping |
| indication\_6 |  | Char | Antibiotic Indication 6 |  |  |
| antibiotic\_7 | ✓ | Char | Antibiotic 7 |  |  |
| route\_7 | ✓ | Char | Antibiotic Route 7 | [route](#route) | Map to values listed under route mapping |
| indication\_7 |  | Char | Antibiotic Indication 7 |  |  |
| service | ✓ | Char | Clinical Service |  | Service is specialty based. Used for classifying patients. |
| service\_group | ✓ | Char | Service Group | [clinical service](#service) | Map from clinical service on day. |
| firstdevice\_ type | ✓ | Char | First Device Type | [device](#device) | Map from first supplemental oxygen device for day. |
| lastdevice\_ type | ✓ | Char | Last Device Type | [device](#device) | Map from last supplemental oxygen device for day. |
| icu |  | Num | Patient was in ICU | [0/1](#zero_one) | Map from hospital department (location) |
| min\_wbc | ✓ | Num | Minimum Measured White Blood Cell Count for Day |  |  |
| max\_wbc | ✓ | Num | Maximum Measured White Blood Cell Count for Day |  |  |
| min\_albumin |  | Num | Minimum Measured Albumin, serum for Day |  |  |
| max\_alt |  | Num | Maximum Measured ALT, serum for Day |  |  |
| max\_ast |  | Num | Maximum Measured AST, serum for Day |  |  |
| max\_bun |  | Num | Maximum Measured BUN, serum for Day |  |  |
| max\_bilirubin |  | Num | Maximum Measured Total bilirubin, serum for Day |  |  |
| max\_creatinine |  | Num | Maximum Measured Creatinine, serum for Day |  |  |
| min\_glucose |  | Num | Minimum Measured Glucose for Day |  |  |
| max\_glucose |  | Num | Maximum Measured Glucose for Day |  |  |
| min\_hct |  | Num | Minimum Measured Hematocrit for Day |  |  |
| min\_hgb |  | Num | Minimum Measured Hemoglobin for Day |  |  |
| max\_inr |  | Num | Maximum Measured INR for Day |  |  |
| min\_na |  | Num | Minimum Measured Sodium, serum for Day |  |  |
| min\_platelets |  | Num | Minimum Measured Platelets for Day |  |  |
| pul\_specimen | ✓ | Num | Pulmonary Specimen Obtained | [0/1](#zero_one) | Indicate if one of the mapped pulmonary specimen types was obtained on day using date specimen was acquired. |
| pul\_specimen\_type |  | Char | Pulmonary Specimen Type | [Pulmonary Specimen](#pulmspec) | Map from microbiology specimen type. If multiple types separate with semicolon. |
| Pul\_specimen\_org1 |  | Char | Culture result from pulmonary specimen |  | Provide culture result – we’ll map these to common terms and groups in the future once we have all possible results |
| Pul\_specimen\_org2 |  | Char | Culture result from pulmonary specimen |  | Provide culture result – we’ll map these to common terms and groups in the future once we have all possible results |
| Pul\_specimen\_org3 |  | Char | Culture result from pulmonary specimen |  | Provide culture result – we’ll map these to common terms and groups in the future once we have all possible results |
| chest\_imaging | ✓ | Num | Chest Imaging Performed | [0/1](#zero_one) | Indicate if one of the mapped chest imaging types was obtained on day using date image was acquired. |
| chest\_imaging\_type |  | Char | Chest Imaging Type | [Chest Imaging](#chestimg) | Map from radiology report description or similar. If multiple types separate with semicolon. |

## Mapped Values

|  |  |
| --- | --- |
| 0/1 | 0 – No  1 – Yes |
| DRG | APDRG  APRDRG  MSDRG |
| Diagnosis | ICD9  ICD10 |
| Race | ASIAN  BLACK  HISPANIC  OTHER/MISSING  WHITE |
| Gender | FEMALE  MALE  UNKNOWN  (leave missing blank) |
| Discharge Disposition | ACUTE CARE HOSPITAL  DEAD  HOME  HOSPICE  OTHER  REHABILITATION FACILITY  SKILLED NURSING FACILITY  (leave missing blank) |
| Device  Device cont. | BIPAP  HIGH FLOW  NASAL CANNULA  NON-REBREATHER  NONE  OXYGEN CONSERVING DEVICE  SIMPLE MASK  VENTILATOR  (map missing to NONE) |
| Clinical Service | ICU  CARDIAC SURGERY  CARDIOLOGY  EMERGENCY  EXCLUDE  GYNECOLOGY  HOSPICE  MEDICINE  NEUROLOGY  OBSTETRICS  ONCOLOGY  OTHER  PSYCHIATRY  SURGERY  (leave missing as blank) |
| Pulmonary Specimen | SPUTUM  BAL  ENDOTRACHEAL ASPIRATE |
| Chest Imaging | CHEST XRAY  CHEST CT |
| Route | IV  PO  OTHER  (leave missing as blank) |

## Hierarchy of Oxygen Delivery Devices

Ordered from lowest severity to highest severity.

|  |  |
| --- | --- |
| Order | Device |
| 1 | Room Air or None |
| 2 | Nasal Cannula |
| 3 | Simple Face Mask |
| 4 | Oxygen conserving device |
| 5 | Non-rebreather mask |
| 6 | High-flow O2 |
| 7 | BIPAP |
| 8 | Invasive mechanical ventilation |

## Sample Data

### Episode

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| siteid | patid | gender | race\_group | admission\_date | discharge\_date | enc\_age | discharge\_group | enc\_death | date\_of\_death |
| Hospital1 | 00001 | MALE | WHITE | 03/01/2016 | 03/04/2016 | 70 | DEAD | 0 | 10/16/2016 |
| Hospital1 | 00001 | MALE | WHITE | 10/05/2018 | 10/16/2016 | 70 | EXPIRED | 1 | 10/16/2016 |

Episode cont.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| drg\_code\_type | | drg | | diagnosis\_code\_type | | admitting\_diagnosis\_1 | | Principle\_diagnosis\_1 | | Diagnosis\_1 | Diagnosis\_2 |
| APRDRG | 650 | | ICD10 | | D73.5 | | D73.89 | | E10.65 | | J18.9 |
| APRDRG | 137 | | ICD10 | | K92.0 | | J15.5 | | E78.5 | | G93.40 |

### Daily

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| siteid | patid | date | min\_temp | max\_temp | avg\_temp | med\_temp | min\_hct |
| Hospital1 | 00001 | 03/01/2016 | 98.40 | 98.70 | 98.55 | 98.55 | 29.2 |
| Hospital1 | 00001 | 03/02/2016 | 99.10 | 99.80 | 98.40 | 98.40 | 35.2 |
| Hospital1 | 00001 | 03/03/2016 | 98.40 | 98.80 | 98.65 | 98.65 | 35.2 |
| Hospital1 | 00001 | 03/04/2016 | 98.10 | 98.40 | 98.20 | 98.20 | 35.2 |

Daily cont.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| antibiotic\_1 | Indication\_1 | Service\_group | firstdevice\_ type | lastdevice\_ type | icu |
|  |  | MEDICINE | NONE | NONE | 0 |
| Azithromycin | Definitive (documented infection) ; Pneumonia | SURGERY | NASAL CANNULA | NASAL CANNULA | 1 |
| Cefepime | Definitive (documented infection) ; Pneumonia | SURGERY | BIPAP | VENTILATOR | 1 |
|  |  | MEDICINE | BIPAP | NONE | 0 |

Daily cont.

|  |  |  |  |
| --- | --- | --- | --- |
| pul\_specimen | pul\_ specimen\_ type | chest\_imaging | chest\_imaging\_type |
| 0 |  | 0 |  |
| 1 | SPUTUM | 1 | CHEST XRAY; CHEST CT |
| 1 | BAL | 0 |  |
| 0 |  | 0 |  |