Supplementary Material

Neonatal Risk Classification Using Machine Learning and Data from Public Health Information Systems and Brazilian Population Census

Jorge Moreira[a], Heder Bernardino[a], Alex Borges[a]

[a]*Instituto de Ciências Exatas, Universidade Federal de Juiz de Fora, Juiz de Fora, 36036-900, Minas Gerais, Brazil*

1. Introdution

This document is complementary material, including tables and figures of the article Classification of Neonatal Risk Using Machine Learning and Data from Information Systems in Public Health and Brazilian Population Census, to be published in the journal Artificial Intelligence in Medicine.

2. Supplementary figures

Neonatal death risk classifiers were evaluated using Friedman's non-parametric test and Nemenyi's *post-hoc* test with a 95% confidence level. The objective was to investigate possible statistical differences in the AUC and F1-score metrics results. The tests revealed that 23 classifiers with the best results for both metrics do not have a statistically significant difference between the results. Two ways of viewing test results were generated for each metric. Thus, Figures 1 show the results for the AUC metric and Figures 2 for the F1-score. Proposed statistical tests, as well as results, are discussed in the Results section of the article.

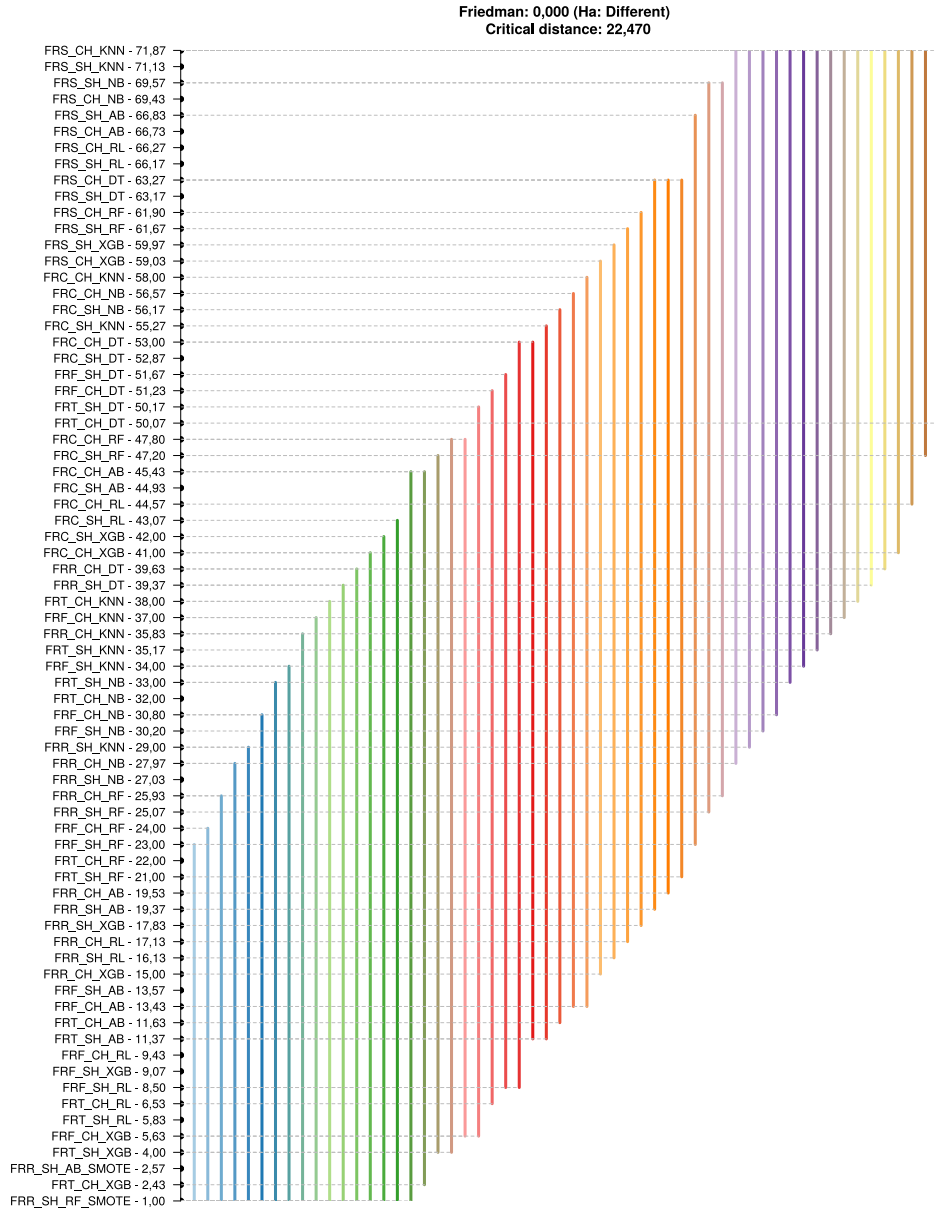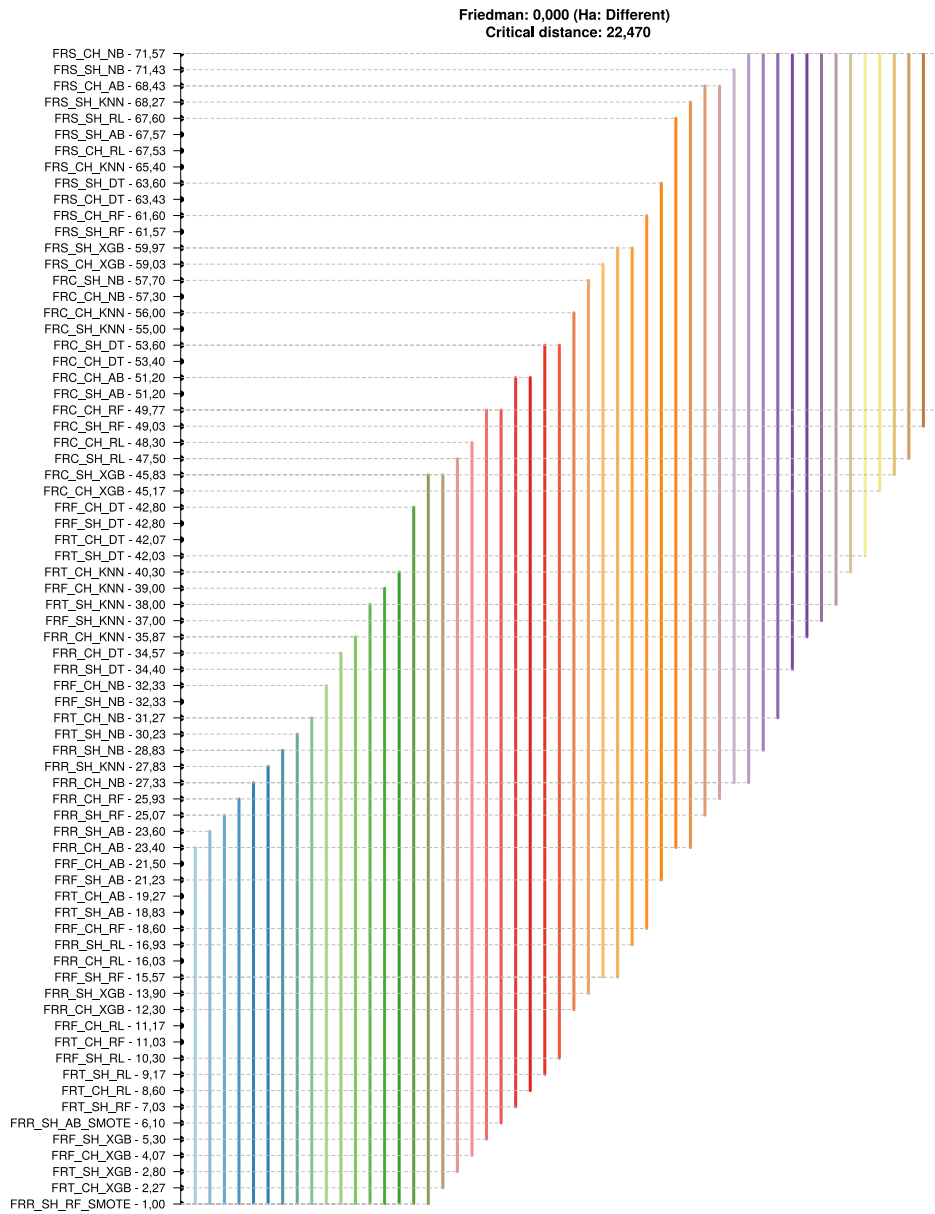Figure 1: Friedman and post-hoc Nemenyi tests for the AUC metric

Friedman: 0,000 (Ha: Different)
Critical distance: 22,470

FRS_CH_KNN - 71,87
FRS_SH_KNN - 71,13
FRS_SH_NB - 69,57
FRS_CH_NB - 69,43
FRS_SH_AB - 66,83
FRS_CH_AB - 66,73
FRS_CH_RL - 66,27
FRS_SH_RL - 66,17
FRS_CH_DT - 63,27
FRS_SH_DT - 63,17
FRS_CH_RF - 61,90
FRS_SH_RF - 61,67
FRS_SH_XGB - 59,97
FRS_CH_XGB - 59,03
FRC_CH_KNN - 58,00
FRC_CH_NB - 56,57
FRC_SH_NB - 56,17
FRC_SH_KNN - 55,27
FRC_CH_DT - 53,00
FRC_SH_DT - 52,87
FRF_SH_DT - 51,67
FRF_CH_DT - 51,23
FRT_SH_DT - 50,17
FRT_CH_DT - 50,07
FRC_CH_RF - 47,80
FRC_SH_RF - 47,20
FRC_CH_AB - 45,43
FRC_SH_AB - 44,93
FRC_CH_RL - 44,57
FRC_SH_RL - 43,07
FRC_SH_XGB - 42,00
FRC_CH_XGB - 41,00
FRR_CH_DT - 39,63
FRR_SH_DT - 39,37
FRT_CH_KNN - 38,00
FRF_CH_KNN - 37,00
FRR_CH_KNN - 35,83
FRT_SH_KNN - 35,17
FRF_SH_KNN - 34,00
FRT_SH_NB - 33,00
FRT_CH_NB - 32,00
FRF_CH_NB - 30,80
FRF_SH_NB - 30,20
FRR_SH_KNN - 29,00
FRR_CH_NB - 27,97
FRR_SH_NB - 27,03
FRR_CH_RF - 25,93
FRR_SH_RF - 25,07
FRF_CH_RF - 24,00
FRF_SH_RF - 23,00
FRT_CH_RF - 22,00
FRT_SH_RF - 21,00
FRR_CH_AB - 19,53
FRR_SH_AB - 19,37
FRR_SH_XGB - 17,83
FRR_CH_RL - 17,13
FRR_SH_RL - 16,13
FRR_CH_XGB - 15,00
FRF_SH_AB - 13,57
FRF_CH_AB - 13,43
FRT_CH_AB - 11,63
FRT_SH_AB - 11,37
FRF_CH_RL - 9,43
FRF_SH_XGB - 9,07
FRF_SH_RL - 8,50
FRT_CH_RL - 6,53
FRT_SH_RL - 5,83
FRF_CH_XGB - 5,63
FRT_SH_XGB - 4,00
FRR_SH_AB_SMOTE - 2,57
FRT_CH_XGB - 2,43
FRR_SH_RF_SMOTE - 1,00

Figure 2: Friedman and Nemenyi post-hoc tests for the F1-score metric

Friedman: 0,000 (Ha: Different)
Critical distance: 22,470

FRS_CH_NB - 71,57
FRS_SH_NB - 71,43
FRS_CH_AB - 68,43
FRS_SH_KNN - 68,27
FRS_SH_RL - 67,60
FRS_SH_AB - 67,57
FRS_CH_RL - 67,53
FRS_CH_KNN - 65,40
FRS_SH_DT - 63,60
FRS_CH_DT - 63,43
FRS_CH_RF - 61,60
FRS_SH_RF - 61,57
FRS_SH_XGB - 59,97
FRS_CH_XGB - 59,03
FRC_SH_NB - 57,70
FRC_CH_NB - 57,30
FRC_CH_KNN - 56,00
FRC_SH_KNN - 55,00
FRC_SH_DT - 53,60
FRC_CH_DT - 53,40
FRC_CH_AB - 51,20
FRC_SH_AB - 51,20
FRC_CH_RF - 49,77
FRC_SH_RF - 49,03
FRC_CH_RL - 48,30
FRC_SH_RL - 47,50
FRC_SH_XGB - 45,83
FRC_CH_XGB - 45,17
FRF_CH_DT - 42,80
FRF_SH_DT - 42,80
FRT_CH_DT - 42,07
FRT_SH_DT - 42,03
FRT_CH_KNN - 40,30
FRF_CH_KNN - 39,00
FRT_SH_KNN - 38,00
FRF_SH_KNN - 37,00
FRR_CH_KNN - 35,87
FRR_CH_DT - 34,57
FRR_SH_DT - 34,40
FRF_CH_NB - 32,33
FRF_SH_NB - 32,33
FRT_CH_NB - 31,27
FRT_SH_NB - 30,23
FRR_SH_NB - 28,83
FRR_SH_KNN - 27,83
FRR_CH_NB - 27,33
FRR_CH_RF - 25,93
FRR_SH_RF - 25,07
FRR_SH_AB - 23,60
FRR_CH_AB - 23,40
FRF_CH_AB - 21,50
FRF_SH_AB - 21,23
FRT_CH_AB - 19,27
FRT_SH_AB - 18,83
FRF_CH_RF - 18,60
FRR_SH_RL - 16,93
FRR_CH_RL - 16,03
FRF_SH_RF - 15,57
FRR_SH_XGB - 13,90
FRR_CH_XGB - 12,30
FRF_CH_RL - 11,17
FRT_CH_RF - 11,03
FRF_SH_RL - 10,30
FRT_SH_RL - 9,17
FRT_CH_RL - 8,60
FRT_SH_RF - 7,03
FRR_SH_AB_SMOTE - 6,10
FRF_SH_XGB - 5,30
FRF_CH_XGB - 4,07
FRT_SH_XGB - 2,80
FRT_CH_XGB - 2,27
FRR_SH_RF_SMOTE - 1,00

3. Supplementary Tables

The study linked records from five different databases to form a consolidated dataset. Two main and three secondary sets were used. The main ones represented by Information Systems on Live Births (Table 1) and Mortality (Table 2), and the secondary ones by the National Register of Health Establishments (Table 3), data from municipal codes registered by the Brazilian Institute of Geography and Statistics (Table 4) and Municipal Human Development Index (Table 5). The article presents the record linking process in the Materials and Methods section.

Table 1: Variables from the Information System on Live Births (SINASC)

Variable	Type	Description
NUMERODN	int8	Live birth declaration number
CODINST	int8	Without description
ORIGEM	int8	Without description
NUMERODV	int8	Without description
PREFIXODN	int8	Without description
CODESTAB	text	establishment code
CODMUNNASC	int8	Municipality of occurrence, in code identical to that of CODMUNRES, according to the TABMUN table
LOCNASC	int8	Place of birth, according to the table: 9: Unknown; 1: Hospital; 2: Other Health Estab; 3: Domicile; 4: Other
def_loc_nasc	text	Place of birth (Nominal, with the following classifications: Hospital; Other health facilities; Home; Public road; Other; Unknown)
IDADEMAE	int8	Mother's age in years
ESTCIVMAE	int8	Marital status, according to the table: 1: Single; 2: Married; 3: Widow; 4: Judicially separated/Divorced; 5: Consensual union (previous versions); 9: Ignored
def_est_civil	text	Marital status (Marital status: Single; Married; Widowed; Legally separated/divorced; Stable union; Unknown)
ESCMAE	int8	Education, years of study completed: 1: None; 2: 1 to 3 years; 3: 4 to 7 years old; 4: 8 to 11 years old; 5: 12 and more; 9: Ignored
def_escol_mae	text	Mother's education (None; 1 to 3 years; 4 to 7 years; 8 to 11 years; 12 years and over; Unknown)
CODOCUPMAE	text	Occupation, according to the Brazilian Classification of Occupations (CBO-2002)
QTDFILVIVO	text	Number of living children
QTDFILMORT	text	number of dead children
CODMUNRES	int8	Mother's municipality of residence, in code identical to that of CODMUNNASC, according to the TABMUN table
GESTACAO	int8	Weeks of gestation, according to the table: 9: Unknown; 1: Less than 22 weeks; 2: 22 to 27 weeks; 3: 28 to 31 weeks; 4: 32 to 36 weeks; 5: 37 to 41 weeks; 6: 42 weeks and more
def_gestacao	text	Week of gestation (Nominal, with the following classifications: Less than 22 weeks; 22 to 27 weeks; 28 to 31 weeks; 32 to 36 weeks; 37 to 41 weeks; 42 weeks or more)
GRAVIDEZ	int8	Type of pregnancy, according to the table: 9: Unknown; 1: Single; 2: Double; 3: Triple and more

def_gravidez	text	Type of pregnancy (Nominal, with the following classifications: Single; Double; Triple and more and Unknown)
PARTO	int8	Type of delivery, according to the table: 9: Unknown; 1: Vaginal; 2: Cesarean
def_parto	text	Type of delivery (Nominal, with the following classifications: Vaginal; Cesarean; Unknown)
CONSULTAS	int8	Number of prenatal consultations: 1: None; 2: from 1 to 3; 3: from 4 to 6; 4: 7 and more; 9: Ignored
def_consultas	text	Number of consultations during prenatal care (None; from 1 to 3; from 4 to 6; 7 and more; Unknown)
DTNASC	text	Date of birth, in yyyymmdd format
data_nasc	date	Date of birth
ano_nasc	int8	year of birth
dia_semana_nasc	text	Day of the week of birth (Sun; Mon; Tue; Wed; Thu; Fri; Sat)
HORANASC	text	birth time
SEXO	int8	Gender, according to the table: 0: Unknown, not informed; 1: Male; 2: Female
def_sexo	text	Gender (Nominal, with the following classifications: Male; Female; Unknown)
APGAR1	text	Apgar in the first minute 00 to 10
APGAR5	text	Apgar in the fifth minute 00 to 10
RACACOR	int8	Race/Color: 1: White; 2: Black; 3: Yellow; 4: Brown; 5: Indigenous
def_raca_cor	text	Race/Color (Nominal, with the following classifications: White; Black; Yellow; Brown; Indigenous)
PESO	text	Birth weight, in grams
IDANOMAL	int8	Congenital anomaly: 9: Unknown; 1: Yes; 2: No
def_anomalia	text	Congenital anomaly (Unknown; Yes; No)
DTCADASTRO	text	Date of registration of the DN in the system
CODANOMAL	text	Code of congenital malformation or chromosomal anomaly, according to ICD-10
NUMEROLOTE	int8	Lot number
VERSAOSIST	text	System version
DTRECEBIM	text	Date received at central level, date of last record update.
DIFDATA	text	Difference between date of death and date of original receipt of DO ([DTNASC] - [DTRECORIG])
DTRECORIGA	text	Date of the 1st batch receipt, given by Sisnet.
NATURALMAE	int8	If the mother is a foreigner, the code of the country of birth will be included.
CODMUNNATU	int8	Mother's city code
CODUFNATU	int8	Mother's State of Birth Code
ESCMAE2010	int8	Schooling 2010. Values: 0 – No schooling; 1 – Fundamental I (1st to 4th grade); 2 – Fundamental II (5th to 8th grade); 3 – Middle (former 2nd Grade); 4 – Incomplete higher education; 5 – Complete higher education; 9 – Ignored.
SERIESCMAE	int8	Mother's school series. Values from 1 to 8.
DTNASCMAE	text	Mother's date of birth
RACACORMAE	int8	Mother's race/color
QTDGESTANT	text	Number of previous pregnancies
QTDPARTNOR	text	Number of vaginal deliveries
QTDPARTCES	text	Number of cesarean deliveries
IDADEPAI	int8	father's age
DTULTMENST	text	Date of last menstruation (LMP): dd mm yyyy
SEMAGESTAC	int8	Number of weeks of gestation.
TPMETESTIM	int8	Method used. Values: 1– Physical examination; 2- Another method; 9 – Ignored.
CONSPRENAT	text	Number of prenatal consultations
MESPRENAT	text	Prenatal month in which prenatal care began

TPAPRESENT	int8	Type of presentation of the RN. Values: 1– Cephalic; 2 – Pelvic or foot; 3- Transversal; 9 – Ignored.
STTRABPART	int8	Induced labor? Values: 1– Yes; 2- No; 3– Not applicable; 9 – Ignored.
STCESPARTO	int8	Did the cesarean section occur before labor started? Values: 1–Yes; 2- No; 3– Not applicable; 9 – Ignored.
TPNASCASSI	int8	Birth was attended by? Values: 1– Physician; 2–Nurse/midwife; 3-Midwife; 4– Others; 9 – Ignored.
TPFUNCRESP	int8	Type of role of person responsible for completing the form. Values: 1– Physician; 2 – Nurse; 3- Midwife; 4– Registry clerk; 5– Others.
TPDOCRESP	int8	Responsible document type. Values: 1-CNES; 2-CRM; 3-COREN; 4-RG; 5-CPF.
DTDECLARAC	text	Declaration date: dd mm yyyy
ESCMAEAGR1	text	2010 aggregate schooling. Values: 00 – No Education; 01 – Elementary I Incomplete; 02 – Elementary I Complete; 03 – Elementary II Incomplete; 04 – Complete Elementary II; 05 – Incomplete High School; 06 – Complete High School; 07 – Incomplete Higher Education; 08 – Complete Superior; 09 – Ignored; 10 – Fundamental I Incomplete or Unspecific; 11 – Elementary School II Incomplete or Unspecific; 12 – Incomplete or Unspecific High School.
STDNEPIDEM	int8	Epidemiological DO Status. Values: 1 – YES; 0 – NO.
STDNNOVA	int8	New DO status. Values: 1 – YES; 0 – NO.
CODPAISRES	int8	Country of residence code
TPROBSON	text	Robson Group Code, generated by the system
PARIDADE	int8	Without description
KOTELCHUCK	int8	Without description
nasc_MUNNOME	text	City of birth name
nasc_MUNNOMEX	text	Name of the municipality of birth in capital letters and without accents
nasc_AMAZONIA	text	Indicates (Y/N) if the municipality of birth is part of the Legal Amazon (according to IBGE)
nasc_FRONTEIRA	text	Indicates (Y/N) if the municipality of birth is part of the border strip (according to IBGE)
nasc_CAPITAL	text	Indicates (Y/N) if the city of birth is the capital of UF
nasc_MSAUDCOD	int8	Macroregional Health Code to which the municipality of birth belongs
nasc_RSAUDCOD	int8	Regional Health Code to which the municipality of birth belongs
nasc_CSAUDCOD	int8	Health Microregional Code to which the city of birth belongs
nasc_LATITUDE	float8	Latitude of the county of birth
nasc_LONGITUDE	float8	Longitude of the county of birth
nasc_ALTITUDE	int8	Elevation of the city of birth
nasc_AREA	float8	Area of the county of birth
nasc_codigo_adotado	int8	Stores the code currently assigned to the municipality of birth, handling cases in which multiple codes have been used for the same municipality over time
res_MUNNOME	text	Name of the municipality of residence
res_MUNNOMEX	text	Name of the municipality of residence in capital letters and without accents
res_AMAZONIA	text	Indicates (Y/N) if the municipality of residence is part of the Legal Amazon (according to IBGE)
res_FRONTEIRA	text	Indicates (Y/N) if the municipality of residence is part of the border strip (according to IBGE)
res_CAPITAL	text	Indicates (Y/N) if the municipality of residence is the capital of UF
res_MSAUDCOD	int8	Health Macroregional Code to which the Municipality of residence belongs
res_RSAUDCOD	int8	Regional Health Code to which the municipality of residence belongs
res_CSAUDCOD	int8	Health Microregional Code to which the Municipality of residence belongs
res_LATITUDE	float8	Latitude of the municipality of residence

Variable	Type	Description
res_LONGITUDE	float8	Longitude of the county of residence
res_ALTITUDE	int8	Altitude of the municipality of residence
res_AREA	float8	Area of the municipality of residence
res_codigo_adotado	int8	Stores the code currently assigned to the municipality of residence, handling cases in which multiple codes have been used for the same municipality over time
nasc_SIGLA_UF	text	Acronym of the federation unit of birth
nasc_CODIGO_UF	int8	State of birth code
nasc_NOME_UF	text	Name of the federation unit of birth
res_SIGLA_UF	text	Acronym of the federation unit of residence
res_CODIGO_UF	int8	State of residence code
res_NOME_UF	text	Name of the federation unit of residence
nasc_REGIAO	text	Birth federation unit region name
res_REGIAO	text	Region name of the federation unit of residence
codanomal_capitulo	text	ICD-10 chapter of congenital malformation or chromosomal abnormality
codanomal_grupo	text	ICD-10 group of congenital malformation or chromosomal abnormality
codanomal_categoria	text	ICD-10 category of congenital malformation or chromosomal abnormality
codanomal_subcategoria	text	ICD-10 subcategory of congenital malformation or chromosomal abnormality
nasc_coordenadas	text	Coordinates of the city of birth
res_coordenadas	text	Coordinates of the municipality of residence
parto_prematuro	int8	Indicates prematurity of birth. 0: no signs of prematurity; 1: there is evidence of prematurity given by the gestational age (GESTATION¡=4); 2: there is evidence of prematurity given by birth weight (WEIGHT¡2500); 3: Gestational age and birth weight indicate prematurity
def_parto_prematuro	text	Indicates prematurity of birth. Term: there is no evidence of prematurity; Inconclusive-GA: there is evidence of prematurity given by gestational age (GESTATION¡=4); Inconclusive-Weight: there is evidence of prematurity given by birth weight (WEIGHT¡2500); Premature: Gestational age and birth weight indicate prematurity

Table 2: Mortality Information System (SIM)

Variable	Type	Description
NUMERODO	int8	Death certificate number
TIPOBITO	int8	Type of death:1: fetal death2: non-fetal death
def_tipo_obito	text	Type of death (Nominal, with the following classifications: Fetal and Non-Fetal)
DTOBITO	text	Date of death, in yyyymmdd format
data_obito	date	Date of occurrence of death
ano_obito	int8	year of death
dia_semana_obito	text	Day of the week on which the death occurred
NATURAL	int8	Place of birth, according to the table of countries. If you are Brazilian, however, the first digit contains 8 and the others the code of the UF of birth
DTNASC	text	Deceased's date of birth in yyyymmdd format
data_nasc	date	Date of birth
idade_obito_calculado	int8	Age at death calculated using date of death and date of birth
ano_nasc	int8	year of birth
dia_semana_nasc	text	Day of the week on which the birth took place

IDADE	int4	Age, composed of two subfields. The first, of 1 digit, indicates the unit of age, as shown in the following table. The second, two-digit number, indicates the number of units: 0: Age ignored, the second subfield e1: Hours, the second subfield varies from 01 to 232: Days, the second subfield varies from 01 to 293: Months, the second subfield varies from 01 to 114: Years, the second subfield ranges from 00 to 995: Years (more than 100 years), the second subfield ranges from 0 to 99, examples:000: Age unknown020: 20 minutes103: 3 hours204: 4 days305: 5 months400 : less than 1 year, but the number of hours, days or months is unknown410: 10 years505: 105 years
idade_obito_anos	int8	Age at death (in years) reported on the death certificate
idade_obito_meses	int8	Age at death (in months) reported on the death certificate
idade_obito_dias	int8	Age at death (in days) reported on the death certificate
idade_obito_horas	int8	Age at death (in hours) given on the death certificate
idade_obito_mins	int8	Age at death (in minutes) given on the death certificate
SEXO	int8	Gender, according to the table: 0: Unknown1: Male2: Female
def_sexo	text	Gender (Nominal, with the following classifications: Male; Female; Unknown)
RACACOR	int8	Race/Color:1: White2: Black3: Yellow4: Brown5: Indigenous
def_raca_cor	text	Race/Color (Nominal, with the following classifications: White; Black; Yellow; Brown; Indigenous)
ESTCIV	int8	Marital status, according to the table:1: Single2: Married3: Widowed4: Judicially separated5: Consensual union (previous versions)9: Unknown
def_est_civil	text	Marital status (Nominal, with the following classifications: Single; Married; Widowed; Judicially separated/divorced; Common-law marriage; Unknown)
ESC	int8	Education, Years completed:1: None2: 1 to 3 years3: 4 to 7 years4: 8 to 11 years5: 12 and more9: Unknown
def_escol	text	Schooling (Nominal, with the following classifications: None; from 1 to 3 years; from 4 to 7 years; from 8 to 11 years; 12 and more; Unknown)
OCUP	int8	Occupation, according to the Brazilian Classification of Occupations (CBO-2002)
CODBAIRES	int8	Without description
CODMUNRES	int8	Municipality of residence of the deceased, according to IBGE codes
LOCOCOR	int8	Place of occurrence of death, according to the table:9: Unknown1: Hospital2: Other health establishment3: Home4: Public road5: Others
def_loc_ocor	text	Place of occurrence of death (Nominal, with the following classifications: Hospital; Other health facilities; Home; Public road; Others; Unknown)
CODMUNOCOR	int8	City where death occurred, according to IBGE codes
IDADEMAE	int8	Mother's age in years
ESCMAE	int8	Mother's education, Years completed:1: None2: 1 to 3 years3: 4 to 7 years4: 8 to 11 years5: 12 and more9: Unknown
def_escol_mae	text	Mother's education (Nominal, with the following classifications: None; from 1 to 3 years; from 4 to 7 years; from 8 to 11 years; 12 and over; Unknown)
OCUPMAE	int8	Mother's occupation, according to OCCUPATION coding
QTDFILVIVO	int8	Number of living children
QTDFILMORT	int8	Number of children killed, ignored, not including self
GRAVIDEZ	int8	Type of pregnancy, according to the table:9: Unknown1: Single2: Double3: Triple and more
def_gravidez	text	Type of pregnancy (Nominal, with the following classifications: Single; Double; Triple and more; Unknown)

GESTACAO	int8	Weeks of gestation, as shown in the table:9: Unknown1: Less than 22 weeks2: 22 to 27 weeks3: 28 to 31 weeks4: 32 to 36 weeks5: 37 to 41 weeks6: 42 weeks and more
def_gestacao	text	Weeks of gestation (Nominal, with the following classifications: Unknown; Less than 22 weeks; 22 to 27 weeks; 28 to 31 weeks; 32 to 36 weeks; 37 to 41 weeks; 42 weeks and more)
PARTO	int8	Type of delivery, according to the table:9: Ignored1: Vaginal2: Cesarean
def_parto	text	Type of delivery (Nominal, with the following classifications: Vaginal; Cesarean; Unknown)
OBITOPARTO	int8	Death in relation to childbirth, according to table:9: Ignored1: Before2: During3: After
def_obito_parto	text	Indication of how the death was in relation to childbirth (Nominal, with the following classifications: Before; During; After; Unknown)
PESO	int8	Birth weight, in grams
OBITOGRAV	int8	Death during Pregnancy according to table:9: Unknown1: Yes2: No
def_obito_grav	text	Indication of occurrence of death during pregnancy (Nominal, with the following classifications: Yes; No; Unknown)
OBITOPUERP	int8	Death during the puerperium, according to the table:9: Unknown1: Yes, up to 42 days2: Yes, from 43 days to 01 year3: No
def_obito_puerp	text	Indication of death in the puerperium (Nominal, with the following classifications: Yes, up to 42 days after delivery; Yes, from 43 days to 01 years; No; Unknown)
ASSISTMED	int8	Indicates whether there was medical assistance, according to the table:9: Ignored1: With assistance2: Without assistance
def_assist_med	text	Medical assistance (Nominal, with the following classifications: With assistance; Without assistance; Ignored)
EXAME	int8	Indicates whether there was a complementary exam, according to the table:9: Unknown1: Yes2: No
def_exame	text	Indication of examination (Nominal, with the following classifications: Yes; No; Unknown)
CIRURGIA	int8	Indicates whether there was surgery, according to the table:9: Unknown1: Yes2: No
def_cirurgia	text	Indicates whether there was surgery (Nominal, with the following classifications: Yes; No; Unknown)
NECROPSIA	int8	Indicates whether there was a necropsy, according to the table:9: Unknown1: Yes2: No
def_necropsia	text	Confirmation of diagnosis by necropsy (Nominal, with the following classifications: Yes; No; Unknown)
CAUSABAS	text	Basic cause, according to the International Classification of Diseases (ICD), 10th. Revision
LINHAA	text	Line A of the certificate, according to the International Classification of Diseases (ICD), 10a. Revision
LINHAB	text	Line B of the certificate, according to the International Classification of Diseases (ICD), 10a. Revision
LINHAC	text	Line C of the certificate, according to the International Classification of Diseases (ICD), 10a. Revision
LINHAD	text	Line D of the certificate, according to the International Classification of Diseases (ICD), 10a. Revision
LINHAII	text	Line II of the certificate, according to the International Classification of Diseases (ICD), 10a. Revision
CIRCOBITO	int8	Indicates the type of accident, if applicable:9: Unknown1: Accident2: Suicide3: Homicide4: Other
def_circ_obito	text	Indication of the probable circumstance of unnatural death (Nominal, with the following classifications: Accident; Suicide; Homicide; Other; Unknown)

ACIDTRAB	int8	Indicates whether it was an accident at work, according to table:9: Ignored1: Yes2: No
def_acid_trab	text	Indication of the occurrence of an accident at work (Nominal, with the following classifications: Yes; No; Unknown)
FONTE	int8	Source of information, according to the table:9: Unknown1: Police Report2: Hospital3: Family4: Other
def_fonte	text	Source of information (Nominal, with the following classifications: Police Report; Hospital; Family; Other; Unknown)
CODINST	int8	Without description
NUMERODV	int8	Without description
ORIGEM	int8	Without description
HORAOBITO	text	time of death
NUMSUS	int8	Without description
CODMUNNATU	int8	Code of the municipality of birth of the deceased
ESC2010	int8	Schooling 2010. Values: 0 – No schooling; 1 – Fundamental I (1st to 4th grade); 2 – Fundamental II (5th to 8th grade); 3 – Middle (former high school); 4 – Incomplete higher education; 5 – Complete higher education; 9 – Ignored.
SERIESCFAL	int8	Deceased School Series. Values from 1 to 8.
CODESTAB	text	establishment code
ESTABDESCR	text	Without description
ESCMAE2010	int8	Schooling 2010. Values: 0 – No schooling; 1 – Fundamental I (1st to 4th grade); 2 – Fundamental II (5th to 8th grade); 3 – Middle (former high school); 4 – Incomplete higher education; 5 – Complete higher education; 9 – Ignored.
SERIESCMAE	int8	Mother's school series. Values from 1 to 8.
SEMAGESTAC	int8	gestation weeks
NUMERODN	int8	Live birth declaration number
TPMORTEOCO	int8	Inform when death occurred: 1 – during pregnancy; 2 – at birth; 3– in abortion; 4 – up to 42 days after delivery; 5 – from 43 days to 1 year after delivery; 8 – did not occur in these periods; 9 – ignored.
CB_PRE	text	Cause selected without re-selection (new SCB)
CRM	int8	CRM No.
COMUNSVOIM	int8	SVO or IML municipality code
DTATESTADO	text	Certificate Date
NUMEROLOTE	int8	Lot number
TPPOS	text	Investigated death 1-Yes, 2- No
DTINVESTIG	text	date of investigation
CAUSABAS_O	text	Original root cause, the first information that enters the system
DTCADASTRO	text	Registration registration date in the system
ATESTANTE	int8	Indicates whether the signing physician attended the patient:1: Yes2: Substitute3: IML4: SVO5: Others
STCODIFICA	text	Installation status: if encoder (value: Y) or not (value: N)
CODIFICADO	text	Whether it is encoded (value: S) or not (value: N)
VERSAOSIST	text	System version
VERSAOSCB	float8	Root cause selector version
FONTEINV	int8	Investigation source:1: Maternal and/or Child Death Committee2: Home visit / Family interview3: Health Estab / Medical records4: Relationship with other databases5: S V O6: I M L7: Other source8: Multiple sources9: Unknown
DTRECEBIM	text	Date received at central level, date of last record update
ATESTADO	text	CIDs informed in the certificate
DTRECORIGA	text	Date of original receipt: dd mm yyyy
CAUSAMAT	text	External cause associated with a maternal cause

ESCMAEAGR1	text	2010 aggregate schooling. Values: 00 – No Education; 01 – Fundamental I Incomplete; 02 – Elementary I Complete; 03 – Fundamental II Incomplete; 04 – Complete Elementary II; 05 – Incomplete High School; 06 – Complete High School; 07 – Incomplete Higher Education; 08 – Complete Superior; 09 – Ignored; 10 –Fundamental I Incomplete or Unspecific; 11 – Elementary School incomplete or unspecific; 12 – High School Incomplete or Unspecific.
ESCFALAGR1	text	2010 aggregate schooling. Values: 00 – No Education; 01 – Fundamental I Incomplete; 02 – Elementary I Complete; 03 – Fundamental II Incomplete; 04 – Complete Elementary II; 05 – Incomplete High School; 06 – Complete High School; 07 – Incomplete Higher Education; 08 – Complete Superior; 09 – Ignored; 10 –Fundamental I Incomplete or Unspecific; 11 – Elementary School incomplete or unspecific; 12 – High School Incomplete or Unspecific.
STDOEPIDEM	int8	Epidemiological DO Status. Values: 1 – YES; 0 – NO.
STDONOVA	int8	New DO status. Values: 1 – YES; 0 – NO.
DIFDATA	text	Difference between the date of death and the date of original receipt of the DO ([DTOBITO] - [DTRECORIG])
NUDIASOBCO	text	Without description
NUDIASOBIN	text	Without description
DTCADINV	text	Without description
TPOBITOCOR	int8	Without description
DTCONINV	text	Without description
FONTES	text	Without description
TPRESGINFO	int8	Without description
TPNIVELINV	text	Without description
NUDIASINF	text	Without description
DTCADINF	text	Without description
MORTEPARTO	int8	Without description
DTCONCASO	text	Without description
FONTESINF	text	Without description
ALTCAUSA	int8	Without description
res_MUNNOME	text	Name (accented, uppercase and lowercase) of the Municipality (standard DOS, code page 850) of residence of the person who died
res_MUNNOMEX	text	Name (without accents, in capital letters) of the Municipality of residence of the person who died
res_AMAZONIA	text	Indicates (Y or N) if the municipality of residence of the person who died is part of the Legal Amazon (according to IBGE)
res_FRONTEIRA	text	Indicates (Y or N) if the municipality of residence of the person who died is part of the border strip (according to IBGE)
res_CAPITAL	text	Indicates (Y or N) if the municipality of residence of the person who died is the capital of the UF
res_MSAUDCOD	int8	Macroregional Health Code to which the Municipality of residence of the person who died belongs
res_RSAUDCOD	int8	Regional Health Code to which the municipality of residence of the person who died belongs
res_CSAUDCOD	int8	Microregional Health Code to which the Municipality of residence of the person who died belongs
res_LATITUDE	float8	Latitude of the seat of the Municipality of residence of the person who died
res_LONGITUDE	float8	Longitude of the seat of the Municipality of residence of the person who died
res_ALTITUDE	int8	Altitude, in meters, of the seat of the Municipality of residence of the person who died
res_AREA	float8	Area, in square kilometers, of the Municipality of residence of the person who died, according to Resolution 05, of 12/10/2002, of IBGE

res_codigo_adotado	int8	Stores the code assigned to the municipality of residence of the person who died, handling cases in which multiple codes have been used for the same municipality over time
ocor_MUNNOME	text	Name (accented, uppercase and lowercase) of the Municipality (standard DOS, code page 850) where the death occurred
ocor_MUNNOMEX	text	Name (without accents, in capital letters) of the municipality where the death occurred
ocor_AMAZONIA	text	Indicates (Y or N) if the municipality where the death occurred is part of the Legal Amazon (according to IBGE)
ocor_FRONTEIRA	text	Indicates (Y or N) if the municipality where the death occurred is part of the border strip (according to IBGE)
ocor_CAPITAL	text	Indicates (Y or N) if the municipality where the death occurred is the capital of the UF
ocor_MSAUDCOD	int8	Macroregional Health Code to which the municipality where the death belongs
ocor_RSAUDCOD	int8	Regional Health Code to which the municipality where the death belongs
ocor_CSAUDCOD	int8	Health Microregional Code to which the municipality where the death belongs
ocor_LATITUDE	float8	Latitude of the seat of the Municipality where the death occurred
ocor_LONGITUDE	float8	Longitude of the seat of the Municipality where the death occurred
ocor_ALTITUDE	int8	Altitude, in meters, of the seat of the Municipality where the death occurred
ocor_AREA	float8	Area, in square kilometers, of the municipality where the death occurred, according to IBGE Resolution 05, of 12/10/2002
ocor_codigo_adotado	int8	Stores the code assigned to the municipality where the death occurred, handling cases in which multiple codes have been used for the same municipality over time
res_SIGLA_UF	text	Acronym of the federation unit of residence of the person who died
res_CODIGO_UF	text	IBGE code of the Federation Unit of residence of the person who died
res_NOME_UF	text	Name of the federation unit of residence of the person who died
ocor_SIGLA_UF	text	Acronym of the state where the death occurred
ocor_CODIGO_UF	text	IBGE Code of the Federation Unit where the death occurred
ocor_NOME_UF	text	Name of the state where the death occurred
res_REGIAO	text	Name of the region of the state of residence of the deceased
ocor_REGIAO	text	Name of the region of the state where the death occurred
causabas_capitulo	text	ICD-10 Chapter of the underlying cause of death
causabas_grupo	text	ICD-10 group of underlying cause of death
causabas_categoria	text	ICD-10 category of underlying cause of death
causabas_subcategoria	text	ICD-10 subcategory of underlying cause of death
res_coordenadas	text	Coordinates of the municipality of residence of the person who died
ocor_coordenadas	text	Coordinates of the municipality where the death occurred

Table 3: National Register of Health Establishments (CNES)

Variable	Type	Description
CNES	text	National health facility number
CODUFMUN	int8	Code of the municipality of the establishment: UF + MUNIC (no digit)
COD_CEP	text	Postcode of the establishment
CPF_CNPJ	text	CPF of the establishment, if an individual or CNPJ, if a legal entity
PF_PJ	int8	Person indicator: 1-Physical 3-Legal
def_pf_pj	text	Definition of the person indicator
NIV_DEP	int8	Degree of dependency, where: 1-Individual 3-Maintained

def_niv_dep	text	Definition of the degree of dependence
CNPJ_MAN	text	CNPJ of the establishment's maintainer.
COD_IR	text	Indicates the type of tax withholding of the sponsor: 10-PUBLIC Establishment; 11-PHILANTHROPIC establishment; 12-NON-PROFIT Establishment; 13-SIMPLE PROFIT PRIVATE establishment; 14-PROFIT PRIVATE Establishment; 15-SINDICAL Establishment; 16-INDIVIDUAL Establishment; 19-Ret.Maintenance Establishment code 19; IR-Establishment Ret.Maintenance.IR code
def_cod_ir	text	Definition of the type of tax withholding of the sponsor
REGSAUDE	text	NOAS health region code
MICR_REG	text	NOAS health microregion code
DISTRSAN	text	health district code
DISTRADM	text	Initially called the Administrative District, currently the Assistance Module Code according to the local table, in accordance with the State/Municipal Regionalization Master Plan.
VINC_SUS	int8	Link with SUS: 1-Yes 0-No
TPGESTAO	text	Health management: Z-Not informed; D-Double; E-State; M-Municipal; S-No management
def_tpgestao	text	Definition of health management
ESFERA_A	text	Administrative sphere code: 01-Federal; 02-State; 03-Municipal; 04-Private; 99-Sphere not informed
def_esfera_a	text	Definition of the administrative sphere code
RETENCAO	text	Tax withholding code: 00.99-Estab. not informed; 10-PUBLIC Establishment; 11-PHILANTHROPIC establishment; 12-NON-PROFIT Establishment; 13-SIMPLE PROFIT PRIVATE establishment; 14-PROFIT PRIVATE Establishment; 15-SINDICAL Establishment; 16-INDIVIDUAL Establishment
def_retencao	text	Definition of tax withholding code
ATIVIDAD	text	Teaching/research activity code: 01-University Unit; 02-Isolated Superior School Unit; 03-Auxiliary Teaching Unit; 04-Unit WITHOUT Teaching activity; 05- Teaching Hospital; 99- Teaching activity not informed
def_atividad	text	Definition of the teaching/research activity code
NATUREZA	text	Type of organization code: 01-Direct Health Administration (MS, SES, and SMS); 02-Adm Direct other bodies (MEX, MEx, Navy,...); 03-Adm Indirect - Municipalities; 04-Adm Indirect - Public Foundation; 05-Adm Indirect - Public Company; 06-Adm Indirect - Public Social Organization; 07-Private Company; 08-Private Foundation; 09-Cooperative; 10-Autonomous Social Service; 11-Non-profit Charitable Entity; 12-Mixed Economy; 13-Union; 00-Nonexistent nature; 0-Nonexistent nature; 99-Nature not informed
def_natureza	text	Definition of the code of the nature of the organization
CLIENTEL	text	Clientele FLOW code: 01-Spontaneous demand service; 02-Referenced demand service; 03-Spontaneous and referenced demand service; 00-Customer flow not required; 99-Customer flow not informed
def_clientel	text	Definition of the clientele FLOW code
TP_UNID	text	Type of unit (establishment)
def_tp_unid	text	Definition of the type of unit (establishment)
TURNO_AT	text	Service shift code: 01-ATTENDMENT INTERMITTENT SHIFT; 02-CONTINUOUS SERVICE 24 HOURS/DAY (Pl Sat Sun Fer); 03-SHIFTS SERVICE MORNING/AFTERNOON/NIGHT; 04-SERVICE IN THE MORNING ONLY; 05-AFTERNOON SERVICE ONLY; 06-SERVICE SHIFT MORNING/AFTERNOON; 07-ONLY NIGHT SERVICE; 99-Shift not informed
def_turno_at	text	Definition of the service shift code

NIV_HIER	text	Hierarchy level code: 01-NH 1-PAB-PABA; 02-NH 2-Average M1; 03-NH 3-Average M2 and M3; 04-NH 4-AltaComplex.Ambul.; 05-NH 5-Low M1 and M2; 06-NH 6-Average M2 and M3; 07-NH 7-Average M3; 08-NH 8-AltaCompl.Hos/Amb.; 00.99-NH not informed
def_niv_hier	text	Hierarchy level code definition
TP_PREST	int8	Type of Provider: 30-PUBLIC FEDERAL; 40-STATE PUBLIC; 50-MUNICIPAL PUBLIC; 61-PHILANTHROPIC WITH VALID CNAS; 80-UNION UNION; 20-PRIVATE FOR PROFIT PURPOSES; 22-PRIVATE CHOOSING SIMPLES; 60-PRIVATE NON-PROFIT; 99-TYPE OF PROVIDER NOT INFORMED
def_tp_prest	text	Definition of Provider Type
CO_BANCO	text	Merchant Bank Code
CO_AGENC	text	Establishment Agency Code
C_CORREN	text	Merchant's Current Account Code
CONTRATM	text	Municipal contract/agreement number of the link with SUS
DT_PUBLM	text	Year and Month of publication of the contract/municipal agreement (YYYYMM)
CONTRATE	text	State contract/agreement number of the link with SUS
DT_PUBLE	text	Year and Month of publication of the contract/state agreement (YYYYMM)
ALVARA	text	license number
DT_EXPED	text	Year and Month of issuance of the license (YYYYMM)
ORGEXPED	int8	Agency issuing the permit, where: 1-SES 2-SMS
def_orgexped	text	Definition of the agency issuing the permit
AV_ACRED	text	Indicates whether the establishment was evaluated according to the MS Hospital Accreditation Manual, where: 1-Yes 2-No
def_av_acred	text	Definition of the evaluation of the establishment according to the MS Hospital Accreditation Manual
CLASAVAL	text	Classification of the evaluation of the establishment according to the MS Hospital Accreditation Manual: 1-ACCREDITED AT LEVEL 1; 2-ACCREDITED AT LEVEL 2; 3-ACCREDITED AT LEVEL 3; 0-DID NOT MEET THE MINIMUM STANDARDS; 9-Level Assessment not informed
def_clasaval	text	Definition of the evaluation classification of the establishment according to the MS Hospital Accreditation Manual
DT_ACRED	text	Year and Month of accreditation (YYYYMM)
AV_PNASS	text	Indicates whether the establishment was evaluated according to the National Health Services Program - PNASS, where: 1-Yes 2-No
def_av_pnass	text	Definition of the evaluation of the establishment according to the National Health Services Program - PNASS
DT_PNASS	text	Year and Month of PNASS Assessment (YYYYMM)
GESPRG1E	int8	Indicator if the management of the Primary Care activity of the Ambulatory Care Level is state-owned, where: 1-yes 0-no
GESPRG1M	int8	Indicator if the management of the Primary Care activity of the Ambulatory Care Level is municipal, where: 1-yes 0-no
GESPRG2E	int8	Indicator if the management of the activity Medium Complexity of the Level of Ambulatory Care is state, where: 1-yes 0-no
GESPRG2M	int8	Indicator if the management of the activity Medium Complexity of the Level of Ambulatory Care is municipal, where: 1-yes 0-no
GESPRG4E	int8	Indicator if the management of the activity High Complexity of the Level of Ambulatory Care is state, where: 1-yes 0-no
GESPRG4M	int8	Indicator if the management of the activity High Complexity of the Level of Ambulatory Care is municipal, where: 1-yes 0-no
NIVATE_A	int8	Indicates the existence of an Ambulatory Care Level, managed by Municipal/State, for this CNES, where: 1-yes 0-no
GESPRG3E	int8	Indicator if program management cod. 03 is state, where: 1-yes 0-no

GESPRG3M	int8	Indicator if program management cod. 03 is municipal, where: 1-yes 0-no
GESPRG5E	int8	Indicator if the Medium Complexity of Hospital Care Level activity is managed by the state, where: 1-yes 0-no
GESPRG5M	int8	Indicator if the management of the activity Medium Complexity of the Level of Hospital Care is municipal, where: 1-yes 0-no
GESPRG6E	int8	Indicator if the management of the High Complexity Level of Hospital Care activity is carried out by the state, where: 1-yes 0-no
GESPRG6M	int8	Indicator if the management of the High Complexity Level of Hospital Care activity is municipal, where: 1-yes 0-no
NIVATE_H	int8	Indicates the existence of a Hospital Care Level, managed by Municipal/State, for this CNES, where: 1-yes 0-no
QTLEITP1	int8	Number of existing type 1 beds (surgical)
QTLEITP2	int8	Number of existing type 2 (clinical) beds
QTLEITP3	int8	Number of existing beds type 3 (complem.)
LEITHOSP	int8	Indicates the existence of Hospital Beds - Surgical, Clinical and Complementary, for this CNES, where: 1-yes 0-no
QTINST01	int8	Number of pediatric care rooms/offices (URGENCY/EMERGENCY)
QTINST02	int8	Number of rooms/offices for female care (URGENCY/EMERGENCY)
QTINST03	int8	Number of male service rooms/offices (URGENCY/EMERGENCY)
QTINST04	int8	Number of rooms/offices for undifferentiated care (URGENCY/EMERGENCY)
QTINST05	int8	Number of pediatric rest/observation rooms (URGENCY/EMERGENCY)
QTINST06	int8	Number of female rest/observation rooms (URGENCY/EMERGENCY)
QTINST07	int8	Number of men's rest/observation rooms (URGENCY/EMERGENCY)
QTINST08	int8	Number of undifferentiated rest/observation rooms (URGENCY/EMERGENCY)
QTINST09	int8	Number of dentistry offices (URGENCY/EMERGENCY)
QTINST10	int8	Number of Hygienization rooms (URGENCY/EMERGENCY)
QTINST11	int8	Number of plaster rooms (URGENCY/EMERGENCY)
QTINST12	int8	Number of dressing rooms (URGENCY/EMERGENCY)
QTINST13	int8	Number of minor surgery rooms (URGENCY/EMERGENCY)
QTINST14	int8	Number of medical offices (URGENCY/EMERGENCY)
URGEMERG	int8	Indicates the existence of physical installation of URGENCY/EMERGENCY for this CNES, where: 1-yes 0-no
QTINST15	int8	Number of primary clinic offices (OUTPATIENT CARE)
QTINST16	int8	Number of specialized clinic offices (AMBULATORY CARE)
QTINST17	int8	Number of undifferentiated clinic offices (AMBULATORY CARE)
QTINST18	int8	Number of non-medical offices (OUTPATIENT CARE)
QTINST19	int8	Number of female rest/observation rooms (AMBULATORY CARE)
QTINST20	int8	Number of men's rest/observation rooms (AMBULATORY CARE)
QTINST21	int8	Number of pediatric rest/observation rooms (AMBULATORY CARE)
QTINST22	int8	Number of undifferentiated rest/observation rooms (AMBULATORY CARE)
QTINST23	int8	Number of dentistry offices (OUTPATIENT CARE)
QTINST24	int8	Number of minor surgery rooms (OUTPATIENT CARE)
QTINST25	int8	Number of nursing rooms (AMBULATORY CARE)
QTINST26	int8	Number of immunization rooms (AMBULATORY CARE)
QTINST27	int8	Number of nebulization rooms (AMBULATORY CARE)
QTINST28	int8	Number of plaster rooms (AMBULATORY CARE)
QTINST29	int8	Number of dressing rooms (AMBULATORY CARE)
QTINST30	int8	Number of outpatient surgery rooms (AMBULATORY CARE)

ATENDAMB	int8	Indicates the existence of physical installation of OUTPATIENT CARE for this CNES, where: 1-yes 0-no
QTINST31	int8	Number of operating rooms (SURGICAL CENTER)
QTINST32	int8	Number of recovery rooms (SURGICAL CENTER)
QTINST33	int8	Number of outpatient surgery rooms (SURGICAL CENTER)
CENTRCIR	int8	Indicates the existence of physical installation of HOSPITAL CARE - SURGICAL CENTER for this CNES, where: 1-yes 0-no
QTINST34	int8	Number of pre-delivery rooms (OBSTETRIC CENTER)
QTINST35	int8	Number of normal delivery rooms (OBSTETRIC CENTER)
QTINST36	int8	Number of curettage rooms (OBSTETRIC CENTER)
QTINST37	int8	Number of operating rooms (OBSTETRIC CENTER)
CENTROBS	int8	Indicates the existence of physical installation of HOSPITAL CARE - OBSTETRIC CENTER for this CNES, where: 1-yes 0-no
QTLEIT05	int8	Number of pediatric rest/observation beds (URGENCY/EMERGENCY)
QTLEIT06	int8	Number of female rest/observation beds (URGENCY/EMERGENCY)
QTLEIT07	int8	Number of male rest/observation beds (URGENCY/EMERGENCY)
QTLEIT08	int8	Number of undifferentiated rest/observation beds (URGENCY/EMERGENCY)
QTLEIT09	int8	Number of dental equipment (URGENCY/EMERGENCY)
QTLEIT19	int8	Number of female rest/observation beds (AMBULATORY CARE)
QTLEIT20	int8	Number of male rest/observation beds (OUTPATIENT CARE)
QTLEIT21	int8	Number of pediatric rest/observation beds (OUTPATIENT CARE)
QTLEIT22	int8	Number of undifferentiated rest/observation beds (AMBULATORY CARE)
QTLEIT23	int8	Number of dental equipment (OUTPATIENT CARE)
QTLEIT32	int8	Number of recovery beds (SURGICAL CENTER)
QTLEIT34	int8	Number of prepartum beds (OBSTETRIC CENTER)
QTLEIT38	int8	Number of beds for normal newborns (NEONATAL UNIT)
QTLEIT39	int8	Number of beds for pathological newborns (NEONATAL UNIT)
QTLEIT40	int8	Number of rooming-in beds (NEONATAL UNIT)
CENTRNEO	int8	Indicates the existence of physical installation of HOSPITAL CARE - NEONATAL UNIT for this CNES, where: 1-yes 0-no
ATENDHOS	int8	Indicates the existence of physical installation of HOSPITAL CARE for this CNES, where: 1-yes 0-no
SERAP01P	int8	Support service S.A.M.E. or S.P.P. own, where: 1-yes 0-no
SERAP01T	int8	Support service S.A.M.E. or S.P.P. outsourced, where: 1-yes 0-no
SERAP02P	int8	Own Social Service support service, where: 1-yes 0-no
SERAP02T	int8	Outsourced Social Service support service, where: 1-yes 0-no
SERAP03P	int8	Support service Own pharmacy, where: 1-yes 0-no
SERAP03T	int8	Outsourced pharmacy support service, where: 1-yes 0-no
SERAP04P	int8	Own Material Sterilization support service, where: 1-yes 0-no
SERAP04T	int8	Outsourced Material Sterilization support service, where: 1-yes 0-no
SERAP05P	int8	Own Nutrition/Dietics support service (S.N.D.), where: 1-yes 0-no
SERAP05T	int8	Outsourced Nutrition/Dietics support service (S.N.D.), where: 1-yes 0-no
SERAP06P	int8	Own milk support service, where: 1-yes 0-no
SERAP06T	int8	Outsourced milk support service, where: 1-yes 0-no
SERAP07P	int8	Own Milk Bank support service, where: 1-yes 0-no
SERAP07T	int8	Outsourced Milk Bank support service, where: 1-yes 0-no
SERAP08P	int8	Support service Own laundry, where: 1-yes 0-no
SERAP08T	int8	Outsourced laundry support service, where: 1-yes 0-no
SERAP09P	int8	Support service Maintenance of own equipment, where: 1-yes 0-no
SERAP09T	int8	Outsourced Equipment Maintenance support service, where: 1-yes 0-no
SERAP10P	int8	Support service Own ambulance, where: 1-yes 0-no

SERAP10T	int8	Outsourced ambulance support service, where: 1-yes 0-no
SERAP11P	int8	Support service Own mortuary, where: 1-yes 0-no
SERAP11T	int8	Serviço de apoio Necrotério terceirizado, onde: 1-sim 0-não
SERAPOIO	int8	Outsourced mortuary support service, where: 1-yes 0-no
RES_BIOL	int8	Indicates the existence of a support service for this CNES, where: 1-yes 0-no
RES_QUIM	int8	There is collection of biological waste, where: 1-yes 0-no
RES_RADI	int8	There is chemical waste collection, where: 1-yes 0-no
RES_COMU	int8	There is collection of radioactive waste, where: 1-yes 0-no
COLETRES	int8	There is common waste collection, where: 1-yes 0-no
COMISS01	int8	Indicates the existence of some waste collection for this CNES, where: 1-yes 0-no
COMISS02	int8	There is a medical ethics committee, where: 1-yes 0-no
COMISS03	int8	There is a nursing ethics committee, where: 1-yes 0-no
COMISS04	int8	There is a pharmacy and therapy committee, where: 1-yes 0-no
COMISS05	int8	There is a hospital infection control committee, where: 1-yes 0-no
COMISS06	int8	There is a cost appropriation commission, where: 1-yes 0-no
COMISS07	int8	There is a CIPA commission, where: 1-yes 0-no
COMISS08	int8	There is a medical record review committee, where: 1-yes 0-no
COMISS09	int8	There is a review committee for medical and statistical documentation, where: 1-yes 0-no
COMISS10	int8	There is a commission for analysis of deaths and biopsies, where: 1-yes 0-no
COMISS11	int8	There is an epidemiological investigation committee, where: 1-yes 0-no
COMISS12	int8	There is a disease notification commission, where: 1-yes 0-no
COMISSAO	int8	There is a commission for the control of zoonoses and vectors, where: 1-yes 0-no
AP01CV01	int8	Indicates the existence of any commission for this CNES, where: 1-yes 0-no
AP01CV02	int8	Service provided Hospitalization/SUS Agreement, where: 1-yes 0-no
AP01CV05	int8	Service provided Hospitalization/Private Agreement, where: 1-yes 0-no
AP01CV06	int8	Service provided Hospitalization/Agreement Public Health Plan, where: 1-yes 0-no
AP01CV03	int8	Service provided Hospitalization/Agreement Private Health Plan, where: 1-yes 0-no
AP01CV04	int8	Service provided Hospitalization/Own Insurance Plan Agreement, where: 1-yes 0-no
AP02CV01	int8	Service provided Hospitalization/Partnership Insurance Plan Third, where: 1-yes 0-no
AP02CV02	int8	Service provided Ambulatory Care/SUS Agreement, where: 1-yes 0-no
AP02CV05	int8	Service provided Ambulatory Care/Private Agreement, where: 1-yes 0-no
AP02CV06	int8	Service provided Ambulatory Care/Public Health Plan Agreement, where: 1-yes 0-no
AP02CV03	int8	Service provided Ambulatory Care/Private Health Plan Agreement, where: 1-yes 0-no
AP02CV04	int8	Service provided Ambulatory Care/Own Insurance Plan Agreement, where: 1-yes 0-no
AP03CV01	int8	Service provided Ambulatory Care/Third Insurance Plan Agreement, where: 1-yes 0-no
AP03CV02	int8	Service provided SADT/SUS Agreement, where: 1-yes 0-no
AP03CV05	int8	Service provided SADT/Private Agreement, where: 1-yes 0-no
AP03CV06	int8	Service provided SADT/ Public Health Plan agreement, where: 1-yes 0-no

AP03CV03	int8	Service provided SADT/ Private Health Plan Agreement, where: 1-yes 0-no
AP03CV04	int8	Service provided SADT/ Own Insurance Plan Agreement, where: 1-yes 0-no
AP04CV01	int8	Service provided SADT/ Third Party Insurance Plan Agreement, where: 1-yes 0-no
AP04CV02	int8	Service provided Urgency/SUS Agreement, where: 1-yes 0-no
AP04CV05	int8	Service provided Emergency/Private Agreement, where: 1-yes 0-no
AP04CV06	int8	Service provided Emergency/Public Health Insurance Plan, where: 1-yes 0-no
AP04CV03	int8	Service provided Emergency/Private Health Plan Agreement, where: 1-yes 0-no
AP04CV04	int8	Service provided Emergency/Own Insurance Plan Agreement, where: 1-yes 0-no
AP05CV01	int8	Service provided Emergency/Third Party Insurance Plan, where: 1-yes 0-no
AP05CV02	int8	Service provided Others/SUS Agreement, where: 1-yes 0-no
AP05CV05	int8	Service provided Others/Private Agreement, where: 1-yes 0-no
AP05CV06	int8	Service provided Others/Agreement Public Health Plan, where: 1-yes 0-no
AP05CV03	int8	Service provided Others/Private Health Insurance Plan, where: 1-yes 0-no
AP05CV04	int8	Service provided Others/Own Insurance Plan Agreement, where: 1-yes 0-no
AP06CV01	int8	Service provided Others/Third Insurance Plan Agreement, where: 1-yes 0-no
AP06CV02	int8	Service provided Health Surveillance/SUS Agreement, where: 1-yes 0-no
AP06CV05	int8	Service provided by Health Surveillance/Private Insurance, where: 1-yes 0-no
AP06CV06	int8	Service provided Health Surveillance/Public Health Plan Agreement, where: 1-yes 0-no
AP06CV03	int8	Service provided Health Surveillance/Private Health Plan Agreement, where: 1-yes 0-no
AP06CV04	int8	Service provided Health Surveillance/Own Insurance Plan Agreement, where: 1-yes 0-no
AP07CV01	int8	Service provided Health Surveillance/Third Insurance Plan Agreement, where: 1-yes 0-no
AP07CV02	int8	Service provided Regulation/Agreement SUS, where: 1-yes 0-no
AP07CV05	int8	Service provided Regulation/Private Agreement, where: 1-yes 0-no
AP07CV06	int8	Service provided Regulation/Agreement Public Health Plan, where: 1-yes 0-no
AP07CV03	int8	Service provided Regulation/Agreement Private Health Plan, where: 1-yes 0-no
AP07CV04	int8	Service provided Regulation/Agreement Own Insurance Plan, where: 1-yes 0-no
ATEND_PR	int8	Service provided RRegulation/Agreement Plano-Seguro Third, where: 1-yes 0-no
DT_ATUAL	int8	Indicates the existence of some service provided for this CNES, where: 1-yes / 0-no
COMPETEN	text	Year and Month in which the information was updated by the establishment (YYYYMM)
def_competen	text	Year and Month of Information Accrual (YYYYMM)
ano_competen	text	Year and Month of information competence (YYYY/MM)
mes_competen	text	Information literacy year
mun_MUNNOME	text	Information competency month

mun_MUNNOMEX	text	Name (accented, uppercase and lowercase) of the Municipality (standard DOS, code page 850) of the establishment
mun_AMAZONIA	text	Name (without accents, in capital letters) of the Municipality of the establishment
mun_FRONTEIRA	text	Indicates (Y or N) if the establishment's municipality is part of the Legal Amazon (according to IBGE)
mun_CAPITAL	text	Indicates (Y or N) if the establishment's municipality is part of the border strip (according to IBGE)
mun_MSAUDCOD	int8	Indicates (Y or N) if the municipality of the establishment is the capital of the UF
mun_RSAUDCOD	int8	Macroregional Health Code to which the Municipality of the establishment belongs
mun_CSAUDCOD	int8	Regional Health Code to which the Municipality of the establishment belongs
mun_LATITUDE	float8	Health Microregional Code to which the Municipality of the establishment belongs
mun_LONGITUDE	float8	Latitude of the headquarters of the Municipality of the establishment
mun_ALTITUDE	int8	Longitude of the seat of the Municipality of the establishment
mun_AREA	float8	Altitude, in meters, of the seat of the Municipality of the establishment
mun_codigo_adotado	int8	Area, in square kilometers, of the Municipality of the establishment, according to Resolution 05, of 12/10/2002, of IBGE
uf_SIGLA_UF	text	Stores the code assigned to the municipality of the establishment, handling cases in which multiple codes have been used for the same municipality over time
uf_CODIGO_UF	int8	Acronym of the federation unit of the establishment
uf_NOME_UF	text	IBGE Code of the Federation Unit of the establishment
mun_coordenadas	text	Name of the federation unit of the establishment

Table 4: Brazilian Institute of Geography and Statistics Municipal Code Table

Variable	Type	Description
COD_MUNICIPIO	int8	City code
COD_UF	int8	Federal unit code
UF	text	Abbreviation of the federal unit
NOME_MUNICIPIO	text	Municipality Name

Table 5: Municipal Human Development Index 2010.

Variable	Type	Description
UF	text	Abbreviation of the federal unit
NOME_MUNICIPIO	text	Municipality Name
Ranking_IDHM_2010	int8	Position in the MHDI (2010) ranking
IDHM_2010	float8	MHDI (2010) value
IDHM_Renda_2010	float8	MHDI (2010) value income
IDHM_Longevidade_2010	float8	MHDI (2010) Longevity value
IDHM_Educacao_2010	float8	MHDI (2010) Education value