Additional file 1 List of codes and data cleaning methods

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| **Andersen’s behavioral model** | | | | | **Categories** | | |  | **System** | | | **CSV file** | **Coding details** |
| **Predisposing** | |  | | | |  |  | | |  |  |  |  |
|  | **Demographic** | | Gender | Male | | | | | the ED patient visit system | | | Emergency patient list | Used an existing variable. |
|  | Female | | | | |
| Age |  | | | | | the ED patient visit system | | | Emergency patient list | Used an existing variable. |
|  |  | | | | |  |
| Age group | Child | | | | | the ED patient visit system | | | Emergency patient list | Using variable "age", categorized three groups. Aged 0-14 years for "Child", aged 15-64 years for "Adult", aged over 65 years for "Older Adult". |
|  | Adult | | | | |
|  | Older Adult | | | | |
| **Social** | | Marital Status | No partner | | | | | the electronic medical record system | | | Emergency consultation  Medical records  At admission  Nursing data  Adult A | "With partner": Marital status described in the medical chart, etc., if there is a spouse such as "wife", "husband", on the chart, and it is alive. It is assumed that there is a description of a relationship, a fiance, and living together. Patients who are consulted for pregnancy are classified in this category unless otherwise specified as "unmarried"  "No partner": unmarried, separated or bereavement, patients under 15 years of age |
| With partner | | | | |
| Job Status | No work/study | | | | | the electronic medical record system | | | Emergency consultation  Medical records  At admission  Nursing data  Adult A | "Woring/studying": Includes students from elementary school to university (graduate school). At least 7 to 15 years are compulsory educational institutions, so all patients are enrolled in school. If the patient's profession describes the profession or work in the medical record, or if a companion etc. mentions a company colleague or supervisor  " No work/study ": When the occupation is "Before xx" in the description of the medical record, or when "Unemployed" is described, it was judged that this category was included. It also includes cases where welfare benefits are received. Even if you are a full-time housewife (husband), we decided to classify it here in this study |
|  | Working/studying | | | | |
| Household members | Living alone | | | | | the electronic medical record system | | | Emergency consultation  Medical records  At admission  Nursing data  Adult A | " Living alone ": If the patient is living alone, "With partner" who being transferred alone or living apart from one another judged as " Living alone".  " Living with family": Especially when there is a single person and there is no special mention, "With partner", the existence of the partner is not clear, when living with relatives such as own parents and children or living together, the notation in the medical record Patients under the age of 15 were clearly classified into this category if they were clearly admitted to the facility. In the case of short stay patients and transport from the facility, basically refer to the family living together at home. |
| Living with family | | | | |
| **Beliefs** | | History of same hospital use | No | | | | | the ordering system | | | Disease name | The disease name file is checked for duplication by patient number, and the oldest date in ascending order of the implementation date with the disease name for each patient is calculated. Combine the data with the patient ID, calculate the difference between the date of initial ED visit of the patient ID in the emergency patient list and the date of implementation (oldest) with the disease name.  when the consultation history was calculated, if it was 0, it was classified as "No", and if it was 1 or more, it was classified as "Yes". |
| Yes | | | | |
| **Enabling** | |  | | | |  |  | | |  |  |  |  |
|  | **Financing** | | Economic status | No problem | | | | | the electronic medical record system | | | Emergency consultation  Medical records  At admission  Nursing data  Adult A  At admission  Nursing data  Child A | "Problematic": If patients are receiving or considering welfare, and they are clearly answering "I am in trouble with economics"  "No problem": No financial problem is specified |
| Problematic | | | | |
| **Organization** | | Date | Weekdays | | | | | the ED patient visit system | | | Emergency patient list | With reference to the 2013 calendar, the dates and times corresponding to Saturdays, Sundays, and Japanese holidays were categorized "Weekend" and others were "Weekdays". |
|  | Weekend | | | | |
| Sift time | Night shift | | | | | the ED patient visit system | | | Emergency patient list | The outpatient reception hours of the study ED s were examined and classified as within that time or outside reception hours.  "Day shift": When the reception hours are from 8:30 to 16:59  "Night shift": When the reception hours are from 0:00 to 8:29, 17:00 to 23:59 |
|  | Day shift | | | | |
| Time | In time | | | | | the ED patient visit system | | | Emergency patient list | Variables were created to determine if the treatment was out of hours.  "In time": When the reception date and reception time are "weekdays" and "day shift" as described above  "Out of time": When the reception date and reception time are "weekdays" and "night shift", or "Weekend" were categorized in this. |
|  | Out of time | | | | |
|  | Method to ED visit | Walk-in | | | | | the ED patient visit system | | | Emergency patient list | Used an existing variable.  "Walk-in": When patients visit the ED using a private car, taxi, or public transportation without using an ambulance.  "Ambulance": When consultation uses an ambulance. Calling number 119 in Japanese phone. |
|  | Ambulance | | | | |
|  | Companies | Alone | | | | | the ED patient visit system | | | Emergency patient list | "With someone": If patients are accompanied to ED, if there is a companion, the description on the medical record will indicate that you have explained to their family, etc., or the description that their family has come to pick you up In some cases, patients under 15 years of age were categorized.  "Alone": When the emergency medical chart clearly states that there is no accompanying person. |
|  | With someone | | | | |
|  | Using health care services | No services | | | | | the electronic medical record system | | | Emergency consultation  Medical records  At admission  Nursing data  Adult A  At admission  Nursing data  Child A | "With services": Care insurance service users and disability certificate holders are classified into this category. And others were "No services". |
|  |  | | With services | | | | |
| **Need** | |  | | | |  |  | | |  |  |  |  |
|  | **Perceived** | | Sign | Cardiovascular | | | | | the ED patient visit system | | | Emergency patient list | It conforms to the list of symptoms at the time of visit of the Japan Triage and Acuity Scale (JTAS). Nurses who have worked in the ED for more than three years and who have attended the JTAS course sponsored by the Japanese Society for Clinical Emergency Medicine have been classified. Basically, among the signs described in the chief complaint / reason for consultation in the emergency consultation chart, the first sign was applied to the relevant classification. When there was no description of the chief complaint / reason for consultation, classification was performed by reading from the remaining description. |
|  |  | |  | ENT-Ears | | | | |
|  |  | |  | ENT-Mouth,throat,neck | | | | |
|  |  | |  | ENT-Nose | | | | |
|  |  | |  | Environmental | | | | |
|  |  | |  | Gastrointestinal | | | | |
|  |  | |  | Genitourinary | | | | |
|  |  | |  | Mental Health | | | | |
|  |  | |  | Neurologic | | | | |
|  |  | |  | OB-GYN | | | | |
|  |  | |  | Ophthalmologic | | | | |
|  |  | |  | Orthopedic | | | | |
|  |  | |  | Respiratory | | | | |
|  |  | |  | Skin | | | | |
|  |  | |  | Substance Misuse | | | | |
|  |  | |  | Trauma | | | | |
|  |  | |  | Common Problem | | | | |
|  | **Evaluated** | | Some Departments use | One department use | | | | | the ED patient visit system | | | Emergency patient list | "One department use": When patients consulted in only one medical department in ED visit.  "Some departments use": When patients visit ED, more than one department in one consultation. |
|  |  | | Some departments use | | | | |
|  |  | | JTAS | Resuscitation | | | | | the ED patient visit system | | | Emergency patient list | The raw data determined by the medical staff at the target hospital was used. At the ED, there is a trained triage nurse at the reception. Patients who come to the hospital on their own will come into direct contact with them and make vital measurements and interviews to determine the degree of urgency. In addition, an emergency physician gives an emergency judgment to patients who come to the hospital by ambulance. This item is basically classified based on the interview at the visit and the vital sign measurement, and is considered to be a value that can indicate the urgency of the medical treatment at the visit.  "Resuscitation": A condition that could result in loss of life or limbs (or a risk of impending deterioration) that requires immediate aggressive treatment.  "Emergency": Conditions requiring immediate treatment because of potential loss of life or limb function  "Semi emergency": A condition that has become so severe that it may require immediate medical attention. It may have severe discomfort and may interfere with your work, or in your daily life. Disturbed condition  "Low emergency": Symptoms related to the patient's age, feeling painful, and potentially exacerbating, and should be treated or re-evaluated within 1 to 2 hours.  "Non-emergency": Symptoms in the acute phase but not urgent, and if they are part of the chronic phase symptoms with or without exacerbation. |
|  |  | |  | Emergency | | | | |
|  |  | |  | Semi emergency | | | | |
|  |  | |  | Low emergency | | | | |
|  |  | |  | Non-emergency | | | | |
|  |  | | Diagnosis | I Infectious diseases | | | | | the ED patient visit system | | | Emergency patient list | The diagnosis was classified according to ICD10. When more than one diagnosis was listed, the one listed at the top was classified. First, Aothors downloaded the master Excel file of ICD10 classification from the Internet, and classified the matching ones. Items that were not categorized next were sorted, and an author with at least three years of nurse experience performed the ICD10 subcategory table. For items that are difficult to classify, we used a search tool on the Internet to classify them one by one. If the name of the disease, such as "Request for prescription", is listed, the classification is unknown. |
|  |  | |  | II Neoplasms | | | | |
|  |  | |  | III Diseases of the blood | | | | |
|  |  | |  | IV Metabolic diseases | | | | |
|  |  | |  | V Mental disorders | | | | |
|  |  | |  | VI Nervous system | | | | |
|  |  | |  | VII Eye and adnexa | | | | |
|  |  | |  | VIII Ear | | | | |
|  |  | |  | IX Circulatory system | | | | |
|  |  | |  | X Respiratory system | | | | |
|  |  | |  | XI Digestive system | | | | |
|  |  | |  | XII Skin | | | | |
|  |  | |  | XIII Musculoskeletal | | | | |
|  |  | |  | XIV Genitourinary system | | | | |
|  |  | |  | XV Pregnancy, childbirth | | | | |
|  |  | |  | XVI Perinatal period | | | | |
|  |  | |  | XVII Congenital | | | | |
|  |  | |  | XVIII Symptoms, signs | | | | |
|  |  | |  | XIX Injury, poisoning | | | | |
|  |  | |  | XXI Health services | | | | |
|  |  | | Disease History | Dementia | | | | | the ordering system  the electronic medical record system | | | Disease name  Emergency consultation  Medical records  At admission  Nursing data  Adult A  At admission  Nursing data | History is defined as "diabetes", "dementia", "myocardial infarction", "peptic ulcer", "congestive heart failure", "peripheral vascular disease", "cerebrovascular disease", "chronic lung disease", The definition of the Charlson Comorbidity Index (CCI) for "collagen disease", "liver disease", "hemiplegia", "renal dysfunction", "solid cancer", "leukemia", and "lymphoma" For reference, classification was performed when the relevant disease name was present. Among the above, some prior studies classified the severity of the disease, but in this study, it was not possible to determine the severity of the disease, so the classification was based only on the disease name. "Hypertension", "asthma", and "mental illness" were classified as risk factors for emergency consultation. |
|  |  | | Myocardial infarction | | | | |
|  |  | | Congestive heart failure | | | | |
|  |  | | Peripheral vascular disease | | | | |
|  |  | | Cerebrovascular disease | | | | |
|  |  | | Chronic pulmonary disease | | | | |
|  |  | | Rheumatologic disease | | | | |
|  |  | | Peptic ulcer disease | | | | |
|  |  | | Liver disease | | | | |
|  |  | | Diabetes | | | | |
|  |  | | Hemiplegia or paraplegia | | | | |
|  |  | | Renal disease | | | | |
|  |  | | Solid tumor | | | | |
|  |  | | Leukemia | | | | |
|  |  | | Lymphoma | | | | |
|  |  | | Hypertension | | | | |
|  |  | | Asthma | | | | |
|  |  | | Mental Disease | | | | |

Note: ICD-10: I Certain infectious and parasitic diseases, II Neoplasms, III Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism, IV Endocrine, nutritional, and metabolic diseases, V Mental and behavioral disorders, VI Diseases of the nervous system, VII Diseases of the eye and adnexa, VIII Diseases of the ear and mastoid process, IX Diseases of the circulatory system, X Diseases of the respiratory system, XI Diseases of the digestive system, XII Diseases of the skin and subcutaneous tissue, XIII Diseases of the musculoskeletal system and connective tissue, XIV Diseases of the genitourinary system, XV Pregnancy, childbirth, and the puerperium, XVI Certain conditions originating in the perinatal period, XVII Congenital malformations, deformations, and chromosomal abnormalities, XVIII Symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified, XIX Injury, poisoning, and certain other consequences of external causes, XXI Factors influencing health status and contact with health services