Supplemental Online Content

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This supplemental material has been provided by the authors to give readers additional information about their work.
eAppendix 1. Supplementary Methods and Definitions and Codes for Case Identification

Postsepsis morbidity concept and operationalization

To identify diagnoses associated with postsepsis morbidity, we conducted a comprehensive literature review on reviews, round table/position papers, and large cohort studies investigating impairments following acute care treatment with sepsis or intensive care treatment.\textsuperscript{1,9,11,36,39-41} We classified diagnoses as medical, psychological, or cognitive (Table S1). For the identification of each diagnosis in hospital discharge and outpatient data, relevant ICD-10 codes or procedural codes were identified (i) from prior literature,\textsuperscript{42-45} or (ii) in the ICD-10-GM and list of procedural codes, to ensure completeness of definitions. The classification and ICD-10-GM definitions were reviewed in an iterative process by experts from the following fields:

- for sepsis rehabilitation Klinik Bavaria, Kreischa (Prof. Oehmichen, Dr. Sauter)
- from the SMOOTH\textsuperscript{46} study group (Dr. Konrad Schmidt, A. Freytag)
- from the REPAIR\textsuperscript{47} study group (PD Dr. Rosendahl, Dr. Gawlytta)
- for sepsis-related pain (Prof. Meißner) and neurology/geriatrics (PD Preul)
- from the SEPFROK expert panel (Prof. Vollmar (general medicine), Prof. Janssens (intensive care), Dr. Hecker (patient safety), A. Trumann (sepsis survivor), Dr. Rosseau (pulmonology), L. Ullrich (intensive care nursing)).

| Diagnosis associated with Postsepsis morbidity | Psychological | Cognitive | Medical |
|------------------------------------------------|---------------|-----------|---------|
| Diagnose                                       |               |           |         |
| PTSD                                           | Cognitive dysfunction |             | Respiratory dysfunction |
| Depression                                     |               |           |         |
| Anxiety                                        |               |           |         |
| Sleeping disorders                             |               |           |         |
| PTSD                                           | Cognitive dysfunction |             | Respiratory dysfunction |
| Depression                                     |               |           |         |
| Anxiety                                        |               |           |         |
| Sleeping disorders                             |               |           |         |
| PTSD                                           | Cognitive dysfunction |             | Respiratory dysfunction |
| Depression                                     |               |           |         |
| Anxiety                                        |               |           |         |
| Sleeping disorders                             |               |           |         |

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| Substance abuse                          | Hepatic dysfunction                                      |
|----------------------------------------|-----------------------------------------------------------|
|                                        | Metabolic diseases                                        |
|                                        | - Diabetes mellitus                                       |
|                                        | - Other metabolic diseases                                |
|                                        | Anaemia                                                   |
|                                        | Neuromuscular/musculoskeletal diseases                    |
|                                        | - ICUAW/CIP/CIM                                           |
|                                        | - Dysphagia                                               |
|                                        | - Voice disorders                                         |
|                                        | - Contractures                                            |
|                                        | - Immobility                                              |
|                                        | Decubitus ulcer                                           |
|                                        | Compl. of tracheostomy                                    |
|                                        | - Tracheal stenoses                                       |
|                                        | Urogenital diseases                                       |
|                                        | - Incontinence                                            |
|                                        | - Sexual disorders                                        |
|                                        | - Urethral stricture                                      |
|                                        | Sensory disorders                                         |
|                                        | - Vestibular disorders                                    |
|                                        | - Hearing disorder                                        |
|                                        | - Taste and smelling disorders                            |
|                                        | Impairment of nutrition                                   |
|                                        | Chronic pain                                              |
|                                        | Infection with multi-resistant bacteria                    |
|                                        | Fatigue                                                   |

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**Case identification: Definitions and Codes**

The identification of sepsis patients in our study was based on the following ICD-10-GM codes in health claims data. At least one of the codes had to be coded as primary and secondary discharge diagnosis. During the complete observation period, sepsis coding was based on the sepsis-1/2 criteria in Germany. Therefore, severity was classified as: sepsis – all forms; severe sepsis (including septic shock); septic shock; and non-severe sepsis.

| Sepsis ICD-10-GM Codes: | Description |
|-------------------------|-------------|
| A02.1 | Salmonella sepsis |
| A20.0 | Bubonic plague |
| A20.7 | Septicaemic plague |
| A21.7 | Generalized tularaemia |
| A22.7 | Anthrax sepsis |
| A24.1 | Acute or fulminating melioidosis |
| A26.7 | Erysipelothrix sepsis |
| A28.2 | Extraintestinal yersiniosis |
| A32.7 | Listerial sepsis |
| A39.1 | Waterhouse-Friderichsen syndrome |
| A39.2 | Acute meningococcal sepsis |
| A39.3 | Chronic meningococcal sepsis |
| A39.4 | Meningococcaemia, unspecified |
| A40 | Streptococcal sepsis |
| A41 | Other sepsis |
| A42.7 | Actinomycotic sepsis |
| A48.3 | Toxic shock syndrome |
| A49.9 | Bacterial infection, unspecified |
| A54.8 | Other gonococcal infections |
| B00.7 | Disseminated herpesviral disease |
| B37.6 | Candidal endocarditis |
| B37.7 | Candidal sepsis |
| B49 | Unspecified mycosis |
| O75.3 | Other infection during labour |
| O85 | other puerperal infections |
| R65.0 | Systemic Inflammatory Response Syndrome of infectious origin without organ failure |
| R65.1 | Systemic Inflammatory Response Syndrome of infectious origin with organ failure |
| R57.2 | Septic shock |

**Severe sepsis ICD-10-GM Codes:**

| Severe sepsis ICD-10-GM Codes: | Description |
|---------------------------------|-------------|
| R65.1 | Systemic Inflammatory Response Syndrome of infectious origin with organ failure |

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**Septic shock**

| ICD-10-GM Codes: | R57.2 | Septic shock |

**Characteristics of sepsis and index treatment**

Assessed at discharge from the index treatment

**Focus of infection**

- **Respiratory tract**

| ICD-10-GM Codes: | Acute sinusitis | J01 |
|------------------|-----------------|-----|
|                   | Acute pharyngitis | J02 |
|                   | Acute tonsillitis | J03 |
|                   | Acute laryngitis and tracheitis | J04 |
|                   | Acute upper respiratory infections of multiple and unspecified sites | J06 |
|                   | Acute obstructive laryngitis [croup] and epiglottitis | J05 |
|                   | Influenza due to identified zoonotic or pandemic influenza virus | J09 |
|                   | Influenza due to identified seasonal influenza virus | J10 |
|                   | Influenza, virus not identified | J11 |
|                   | Viral pneumonia, not elsewhere classified | J12 |
|                   | Pneumonia due to Streptococcus pneumoniae | J13 |
|                   | Pneumonia due to Haemophilus influenzae | J14 |
|                   | Bacterial pneumonia, not elsewhere classified | J15 |
|                   | Pneumonia due to other infectious organisms, not elsewhere classified | J16 |
|                   | Pneumonia in diseases classified elsewhere | J17 |
|                   | Pneumonia, organism unspecified | J18 |
|                   | Acute bronchitis | J20 |
|                   | Acute bronchiolitis | J21 |
|                   | Unspecified acute lower respiratory infection | J22 |
|                   | Chronic obstructive pulmonary disease with acute lower respiratory infection | J44.0 |
|                   | Chronic obstructive pulmonary disease with acute exacerbation, unspecified | J44.1 |
|                   | Pyothorax | J86 |
|                   | Abscess of lung and mediastinum | J85 |
|                   | Respiratory tuberculosis, bacteriologically or histologically confirmed | A15 |
|                   | Respiratory tuberculosis, not confirmed bacteriologically or histologically | A16 |
|                   | Hospital-acquired pneumonia in other diseases classified elsewhere | U69.00 |
|                   | Diphtheria | A36 |
|                   | Whooping cough | A37 |
|                   | Coccidioidomycosis | B38 |
|                   | Histoplasmosis | B39 |

**Abdominal infections**

| ICD-10-GM Codes: | |

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| Code  | Description                                                      |
|-------|-----------------------------------------------------------------|
| A00   | Cholera                                                          |
| A01   | Typhoid and paratyphoid fevers                                  |
| A02   | Other salmonella infections                                     |
| A03   | Shigellosis                                                      |
| A04   | Other bacterial intestinal infections                            |
| A05   | Other bacterial foodborne intoxications, not elsewhere classified |
| A06   | Amoebiasis                                                      |
| A07   | Other protozoal intestinal diseases                              |
| A08   | Viral and other specified intestinal infections                  |
| A09   | Other gastroenteritis and colitis of infectious and unspecified origin |
| K35   | Acute appendicitis                                              |
| K37   | Unspecified appendicitis                                        |
| K36   | Other appendicitis                                              |
| K57.02| Diverticular disease of small intestine with perforation and abscess without bleeding |
| K57.03| Diverticular disease of small intestine with perforation and abscess with bleeding |
| K57.12| Diverticular disease of small intestine without perforation or abscess without bleeding |
| K57.13| Diverticular disease of small intestine without perforation or abscess with bleeding |
| K57.22| Diverticular disease of large intestine with perforation and abscess without bleeding |
| K57.23| Diverticular disease of large intestine with perforation, abscess and bleeding |
| K57.32| Diverticular disease of large intestine without perforation or abscess without bleeding |
| K57.33| Diverticular disease of large intestine without perforation or abscess with bleeding |
| K57.42| Diverticular disease of both small and large intestine with perforation and abscess without bleeding |
| K57.43| Diverticular disease of both small and large intestine with perforation, abscess and bleeding |
| K57.52| Diverticular disease of both small and large intestine without perforation or abscess or bleeding |
| K57.53| Diverticular disease of both small and large intestine without perforation or abscess with bleeding |
| K57.82| Diverticular disease of intestine, part unspecified, with perforation and abscess without bleeding |
| K57.83| Diverticular disease of intestine, part unspecified with perforation, abscess and bleeding |
| K57.92| Diverticular disease of intestine, part unspecified, without perforation, abscess or bleeding |
| K57.93| Diverticular disease of intestine, part unspecified, without perforation or abscess with bleeding |
| K61   | Abscess of anal and rectal regions                               |
| K65   | Peritonitis                                                     |
| K67   | Disorders of peritoneum in infectious diseases classified elsewhere |
| K63.0 | Abscess of intestine                                             |
| K63.1 | Perforation of intestine (nontraumatic)                         |
| Code  | Description                                                                 |
|-------|-----------------------------------------------------------------------------|
| K75.0 | Abscess of liver                                                            |
| K75.1 | Phlebitis of portal vein                                                   |
| K81.0 | Cholecystitis                                                               |
| K77.0 | Liver disorders in infectious and parasitic diseases classified elsewhere   |
| U69.40! | Recurrent infection due to Clostridium difficile                           |

**Wound/soft tissue infection**

ICD-10-GM Codes:

| Code | Description |
|------|-------------|
| A46  | Erysipelas   |
| B47  | Mycetoma     |
| L03  | Phlegmon     |
| L04  | Acute lymphadenitis |
| L05  | Pilonidal cyst |
| B00  | Herpesviral [herpes simplex] infections |
| B07  | Viral warts   |
| B08  | Other viral infections characterized by skin and mucous membrane lesions, not elsewhere classified |
| B09  | Unspecified viral infection characterized by skin and mucous membrane lesions |
| H05.0 | Acute inflammation of orbit |
| H60.2 | Malignant otitis externa |
| H70.0 | Acute mastoiditis |
| J36  | Peritonsillar abscess |
| J39.0 | Retropharyngeal and parapharyngeal abscess |
| J39.1 | Other abscess of pharynx |
| L02  | Cutaneous abscess, furuncle and carbuncle |

**Genitourinary system infection**

ICD-10-GM Codes:

| Code | Description |
|------|-------------|
| N10  | Acute tubulo-interstitial nephritis |
| N15.1 | Renal and perinephric abscess |
| N15.9 | Renal tubulo-interstitial disease, unspecified |
| N34  | Urethritis and urethral syndrome |
| N30  | Cystitis |
| N39.0 | Urinary tract infection, site not specified |
| N41  | Inflammatory diseases of prostate |
| N45  | Orchitis and epididymitis |
| N48.2 | Other inflammatory disorders of penis |
| N49  | Inflammatory disorders of male genital organs, not elsewhere classified |
| N70  | Salpingitis and oophoritis |
| N71  | Inflammatory disease of uterus, except cervix |
| N72  | Inflammatory disease of cervix uteri |
| N73  | Other female pelvic inflammatory diseases |

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| Code  | Description                                                                 |
|-------|-----------------------------------------------------------------------------|
| N74   | Female pelvic inflammatory disorders in diseases classified elsewhere        |
| N75   | Diseases of Bartholin gland                                                 |
| N76   | Other inflammation of vagina and vulva                                      |
| N77   | Vulvovaginal ulceration and inflammation in diseases classified elsewhere    |
| N61   | Inflammatory disorders of breast                                            |
| N98.0 | Infection associated with artificial insemination                           |
| A59   | Trichomoniasis                                                              |
| A55   | Chlamydial lymphogranuloma (venereum)                                       |
| A56   | Other sexually transmitted chlamydial diseases                              |

**Central nervous system infection**

**ICD-10-GM Codes:**

| Code | Description                                                                 |
|------|-----------------------------------------------------------------------------|
| A39  | Meningococcal infection                                                    |
| A39* | Encephalitis, myelitis and encephalomyelitis in diseases classified elsewhere|
| G00  | Bacterial meningitis, not elsewhere classified                              |
| G01  | Meningitis in bacterial diseases classified elsewhere                        |
| G02  | Meningitis in other infectious and parasitic diseases classified elsewhere   |
| G03  | Meningitis due to other and unspecified causes                              |
| G04  | Encephalitis, myelitis and encephalomyelitis                                |
| G05* | Encephalitis, myelitis and encephalomyelitis in diseases classified elsewhere|
| G06  | Intracranial and intraspinal abscess and granuloma                          |
| G07* | Intracranial and intraspinal abscess and granuloma in diseases classified elsewhere |
| G08  | Intracranial and intraspinal phlebitis and thrombophlebitis                 |
| A17+ | Tuberculosis of nervous system                                               |
| A81  | Atypical virus infections of central nervous system                          |
| A83  | Mosquito-borne viral encephalitis                                           |
| A84  | Tick-borne viral encephalitis                                               |
| A85  | Other viral encephalitis, not elsewhere classified                           |
| A86  | Unspecified viral encephalitis                                              |
| A87  | Viral meningitis                                                            |
| A88  | Other viral infections of central nervous system, not elsewhere classified   |
| A89  | Unspecified viral infection of central nervous system                        |

**Cardiovascular system infection**

**ICD-10-GM Codes:**

| Code | Description                                                                 |
|------|-----------------------------------------------------------------------------|
| I32  | Pericarditis in diseases classified elsewhere                               |
| I33  | Acute and subacute endocarditis                                             |
| I39  | Endocarditis and heart valve disorders in diseases classified elsewhere     |
| I40  | Acute myocarditis                                                           |
| I41  | Myocarditis in diseases classified elsewhere                                |
| I80  | Thrombosis, phlebitis and thrombophlebitis                                  |
| I80  | Endocarditis, valve unspecified                                              |
| I98.1| Cardiovascular disorders in other infectious and parasitic diseases classified elsewhere |
| Device-related infections ICD-10-GM Codes: |                                                                                     |
|-----------------------------------------|-------------------------------------------------------------------------------------|
| T82.6                                   | Infection and inflammatory reaction due to cardiac valve prosthesis                 |
| T82.7                                   | Infection and inflammatory reaction due to other cardiac and vascular devices, implants and grafts |
| T83.5                                   | Infection and inflammatory reaction due to prosthetic device, implant and graft in urinary system |
| T83.6                                   | Infection and inflammatory reaction due to prosthetic device, implant and graft in genital tract |
| T84.5                                   | Infection and inflammatory reaction due to internal joint prosthesis                |
| T84.6                                   | Infection and inflammatory reaction due to internal fixation device [any site]       |
| T84.7                                   | Infection and inflammatory reaction due to other internal orthopaedic prosthetic devices, implants and grafts |
| T85.7                                   | Infection and inflammatory reaction due to other internal prosthetic devices, implants and grafts |

| Pregnancy associated infection ICD-10-GM Codes: |                                                                                     |
|-----------------------------------------------|-------------------------------------------------------------------------------------|
| O75.3                                         | Other infection during labour                                                       |
| O85                                           | Puerperal fever                                                                    |
| O03.0                                         | Spontaneous abortion, complicated by genital tract and pelvic infection, incomplete |
| O03.5                                         | Spontaneous abortion, complicated by genital tract and pelvic infection, complete or unspecified |
| O04.0                                         | Medical abortion, complicated by genital tract and pelvic infection, incomplete       |
| O04.5                                         | Medical abortion, complicated by genital tract and pelvic infection, complete or unspecified |
| O05.0                                         | Other abortion, complicated by genital tract and pelvic infection, incomplete        |
| O05.5                                         | Other abortion, complicated by genital tract and pelvic infection, complete or unspecified |
| O06.0                                         | Unspecified abortion, complicated by genital tract and pelvic infection, incomplete |
| O06.5                                         | Unspecified abortion, complicated by genital tract and pelvic infection, complete or unspecified |
| O07.0                                         | Failed medical abortion, complicated by genital tract and pelvic infection           |
| O07.5                                         | Other and unspecified failed attempted abortion, complicated by genital tract and pelvic infection |
| O08.0                                         | Genital tract and pelvic infection following abortion and ectopic and molar pregnancy |
| O86                                           | Other puerperal infections                                                          |
| O23                                           | Infections of genitourinary tract in pregnancy                                     |
| O41.1                                         | Infection of amniotic sac and membranes                                            |
| O88.3                                         | Obstetric pyaemic and septic embolism                                               |
| O91                                           | Infections of breast associated with childbirth                                     |
Hospital-acquired infections

ICD-10-GM Codes:

| Code   | Description                                                                 |
|--------|-----------------------------------------------------------------------------|
| T82.6  | Infection and inflammatory reaction due to cardiac valve prosthesis         |
| T82.7  | Infection and inflammatory reaction due to other cardiac and vascular devices, implants and grafts |
| T84.5  | Infection and inflammatory reaction due to internal joint prosthesis        |
| T84.6  | Infection and inflammatory reaction due to internal fixation device [any site] |
| T84.7  | Infection and inflammatory reaction due to other internal orthopaedic prosthetic devices, implants and grafts |
| T85.72 | Infection and inflammatory reaction due to internal prosthetic devices, implants and grafts in the central nervous system |
| T85.73 | Infection and inflammatory reaction due to prosthetic devices or implants of the mamma |
| T85.75 | Infection and inflammatory reaction due to internal prosthetic devices, implants or grafts of the hepatobiliary system or pancreas |
| T85.76 | Infection and inflammatory reaction due to internal prosthetic devices, implants or grafts of the other gastrointestinal system |
| T85.78 | Infection and inflammatory reaction due to other internal prosthetic devices, implants and grafts |
| O86.0  | Infection of obstetric surgical wound                                      |
| T83.5  | Infection and inflammatory reaction due to prosthetic device, implant and graft in urinary system |
| T83.6  | Infection and inflammatory reaction due to prosthetic device, implant and graft in genital tract |
| A04.7  | Enterocolitis due to Clostridium difficile                                  |
| U69.40 | Recurrent infection due to Clostridium difficile                            |
| T80.2  | Infections following infusion transfusion and therapeutic injection        |
| T82.7  | Infection and inflammatory reaction due to other cardiac and vascular devices, implants and grafts |
| T81.4  | Infection following a procedure, not elsewhere classified                   |
| T85.71 | Infection and inflammatory reaction due to peritoneal dialysis catheter     |
| T85.74 | Infection and inflammatory reaction due to percutaneous endoscopic gastrostomy/jejunostomy,T88.0 |
| U69.00 | Hospital-acquired pneumonia in patients aged 18 years or older              |

Multidrug-resistant infections

ICD-10-GM Codes:

| Code   | Description                                                                 |
|--------|-----------------------------------------------------------------------------|
| U80.1  | Grampositive bacteria with specified antibiotic resistance, requiring special therapeutic or hygienic measures |
| U81.1  | Gram negative bacteria with specified antibiotic resistanc, requiring special therapeutic or hygienic measures |
| U82.1  | Mycobacteria with resistance against TB drugs (first line)                  |
| U83.1  | Candida with resistance against Fluconazole and Voriconazole                |
| U84.1  | Herpes virus with restistance against antivirals                             |
| U85! | Human Immunodeficiency Virus with resistance against antivirals or proteinase inhibitors |
|--------------------------------|------------------------------------------------------------------------------------------------|
| OPS Codes: | Complex treatment in the case of colonisation or infection with multidrug-resistant pathogens [MDR] |

| Organ dysfunctions | Cardiovascular dysfunction/shock |
|-------------------|---------------------------------|
| ICD-10-GM Codes: |                                 |

| Code | Description                          |
|------|--------------------------------------|
| I95.9 | Hypotension, unspecified             |
| R57.8 | Other shock                          |
| R57.9 | Shock, unspecified                   |
| R57.2 | Septic shock                         |

| Respiratory dysfunction |
|-------------------------|
| ICD-10-GM Codes:        |

| Code | Description                                      |
|------|--------------------------------------------------|
| J96  | Respiratory failure, not elsewhere classified    |
| J80  | Adult respiratory distress syndrome              |
| J98.4| Other disorders of lung                          |
| R06.0| Dyspnoea                                         |
| R06.8| Other and unspecified abnormalities of breathing |

| Encephalopathy |
|----------------|
| ICD-10-GM Codes: |

| Code | Description                                      |
|------|--------------------------------------------------|
| F05  | Delirium, not induced by alcohol and other psychoactive substances |
| G93.1| Anoxic brain damage, not elsewhere classified    |
| G93.4| Encephalopathy, unspecified                      |
| R40  | Somnolence, stupor and coma                      |

| Renal dysfunction |
|-------------------|
| ICD-10-GM Codes:  |

| Code | Description                                      |
|------|--------------------------------------------------|
| N17. | Acute renal failure                              |
| N19  | Unspecified kidney failure                       |

| Metabolic dysfunction |
|-----------------------|
| ICD-10-GM Codes:      |

| Code | Description                                      |
|------|--------------------------------------------------|
| E87.2| Acidosis                                         |

| Abnormal coagulation |
|----------------------|
| ICD-10-GM Codes:     |

| Code | Description                                      |
|------|--------------------------------------------------|
| Coagulation D65     | Disseminated intravascular coagulation [defibrination syndrome] |
| D68.8              | Other specified coagulation defects              |
| Code   | Description                                          |
|--------|------------------------------------------------------|
| D68.9  | Coagulation defect, unspecified                      |
| D69.5  | Secondary thrombocytopenia                           |
| D69.6  | Thrombocytopenia, unspecified                        |

**Hepatic dysfunction**

ICD-10-GM Codes:

| Code   | Description                                          |
|--------|------------------------------------------------------|
| K72.0  | Acute and subacute hepatic failure                   |
| K72.7  | Hepatic encephalopathy and hepatic coma              |
| K72.9  | Hepatic failure, unspecified                         |
| K76.2  | Central haemorrhagic necrosis of liver               |
| K76.3  | Infarction of liver                                  |

**Other organ dysfunction**

ICD-10-GM Codes:

| Code   | Description                                                                                             |
|--------|---------------------------------------------------------------------------------------------------------|
| R65.1  | Systemic Inflammatory Response Syndrome of infectious origin with organ complications                   |

**ICU Treatment**

OPS Codes:

| Code   | Description                                                                                         |
|--------|------------------------------------------------------------------------------------------------------|
| 8-980  | Intensive care complex treatment                                                                    |
| 8-98f  | Costly intensive care complex treatment (basic procedure)                                           |
| 8-98d  | Intensive care complex treatment in childhood (basic procedure)                                     |
| 8-98c  | Intensive care complex treatment in childhood                                                       |

**Mechanical Ventilation**

OPS Codes:

| Code   | Description                                                                                         |
|--------|------------------------------------------------------------------------------------------------------|
| 8-713  | Mechanical ventilation and respiratory support in adults                                            |
| 8-712  | Mechanical ventilation and respiratory support in children and adolescents                          |
| 8-714  | Special procedure for mechanical ventilation in the case of severe respiratory failure              |
| 8-71   | Mechanical ventilation and respiratory support via a mask or tube and ventilation weaning            |

**Renal replacement therapy**

OPS Codes:

| Code   | Description                                                                                         |
|--------|------------------------------------------------------------------------------------------------------|
| 8-853  | Haemofiltration                                                                                     |
| 8-854  | Haemodialysis                                                                                       |
| 8-855  | Haemodiafiltration                                                                                  |
| 8-857  | Peritoneal dialysis                                                                                 |
| 8-85a  | Dialysis procedure due to a functional failure and failure of a kidney transplant                    |
| Tracheostomy during hospitalization |OPS Codes: |
|-----------------------------------|-----------|
| 5-311                             | Temporary tracheostomy |
| 5-312                             | Permanent tracheostomy |

| Surgical treatment |OPS Codes: |
|--------------------|-----------|
| Any OPS Code from Chapter 5 | |

| Amputation during treatment |OPS Codes: |
|-----------------------------|-----------|
| 5-862                        | Amputation and exarticulation of upper extremity |
| 5-863                        | Amputation and exarticulation of hand |
| 5-864                        | Amputation and exarticulation of lower extremity |
| 5-865                        | Amputation and exarticulation of foot |
| 5-866                        | Revision of amputation area |

| Palliative care |OPS Codes: |
|-----------------|-----------|
| 8-982            | Palliative medical complex treatment |
| 8-98e            | Specialized inpatient palliative medical complex treatment |
| 8-98h            | Specialized palliative medical complex treatment through a palliative care service |

| Early rehabilitation treatment |OPS Codes: |
|-------------------------------|-----------|
| 8-55                          | Interdisciplinary and other early rehabilitation |

| Discharge disposition |Definition |
|-----------------------|-----------|
| regular               | regular termination of treatment, with or without post-discharge treatment intended |
| other hospital        | transfer to another hospital; transfer to another hospital as part of a cooperation; external transfer for psychiatric treatment |
| hospice               | discharge into a hospice |
| rehabilitation        | discharge into a rehabilitation facility |

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| nursing home | discharge into a long-term care facility |
|--------------|------------------------------------------|
| other        | treatment terminated for other reasons, with or without post-discharge treatment intended; |
|              | Treatment terminated against medical advice, with or without post-discharge treatment intended; |
|              | Change of responsibility of the cost bearer; |
|              | Death; |
|              | internal routing; |
|              | Treatment terminated for other reasons, post-inpatient treatment intended; |
|              | external transfer with relocation or change between the Remuneration ranges of the DRG flat rate case, according to section 17b (1) first sentence of the Hospital Funding Act; |
|              | Internal transfer with a change between the DRG fee ranges according to section 17b (1)first sentence of the Hospital Funding Act; |
|              | Relocation; |
|              | Discharge before resumption with reclassification; |
|              | Discharge before resumption with reclassification due to complication; |
|              | Discharge or transfer with subsequent readmission; |
|              | Case closure (internal transfer) when changing between full, day-care and ward-equivalent treatment; |
|              | Start of an outside stay with an absence past midnight (BPflV area - for the specialist department for laying); |
|              | Ending an outside stay with an absence past midnight (BPflV area - for pseudo specialist department 0003); |
|              | Discharge at the end of the year if accepted in the previous year (for the purposes of Billing - § 4 PEPPV); |
|              | Beginning of a period without direct patient contact (station equivalent treatment); |
|              | Termination of a period without direct patient contact (ward equivalent treatment - for pseudo-specialist department 0004); |

12 months prior health and socioeconomic status

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As data on outpatient diagnoses, cases, case-related therapies and corresponding costs in Germany are available on only a quarterly basis, data from quarters 1-4 prior to hospital admission were included in the 12 months look-back, respectively. Both primary and secondary hospital discharge diagnoses as well as outpatient diagnoses labeled as confirmed diagnoses by the treating physicians\textsuperscript{23} were included in the definition of pre-sepsis health impairments.

| Employment Status | Definition |
|-------------------|------------|
| Employed          | Insurance type: 1 = compulsory health insurance, 2 = pension applicant, 5 = self-payer, 6 = rehabilitation |
| Unemployed        | Type of insurance: 3 = pension recipient, 4 = benefits under the Employment Promotion Act, 9 = family insurance |

Comorbidities defined according to Charlson Comorbidity Index\textsuperscript{48}

| Pre-existing immobility ICD-10-GM Codes: | |
|-----------------------------------------|--------------------------|
| R26.2                                   | Difficulty in walking, not elsewhere classified |
| R26.3                                   | Immobility |
| R29.6                                   | Tendency to fall, not elsewhere classified |
| Z99.3                                   | Dependence on wheelchair |
| Z74.0                                   | Need for assistance due to reduced mobility |

| Pre-existing long-term mechanical ventilation ICD-10-GM Codes: | |
|---------------------------------------------------------------|--------------------------|
| Z99.0                                                       | Dependence on aspirator |
| Z99.1                                                       | Dependence on respirator |

| OPS Codes: | |
|------------|--------------------------|
| 8-713      | Mechanical ventilation and respiratory support in adults |
| 8-712      | Mechanical ventilation and respiratory support in children and adolescents |
| 8-714      | Special procedure for mechanical ventilation in the case of severe respiratory failure |
| 8-70       | Access for mechanical ventilation and measures to maintain the airway |
| 8-71       | Mechanical ventilation and respiratory support via a mask or tube and ventilation weaning |
Pre-existing dialysis

ICD-10-GM Codes:

| Code  | Description                                                   |
|-------|---------------------------------------------------------------|
| Z99.2 | Dependence on renal dialysis                                  |
| Z49   | Care involving dialysis                                      |

OPS Codes:

| Code | Description                      |
|------|----------------------------------|
| 5-392| Creation of an arteriovenous fistula |
| 8-853| Haemofiltration                  |
| 8-854| Haemodialysis                    |
| 8-855| Haemodiafiltration               |
| 8-857| Peritoneal dialysis              |

Statutory scale of fees for physicians (GOÄ) Codes:

| Code  | Description                                                                 |
|-------|-----------------------------------------------------------------------------|
| 13602 | Flat rate supplementary fee for continuous care of a patient requiring dialysis |
| 13610 | Flat rate supplementary fee for medical care in the case of haemodialysis, peritoneal dialysis and special procedures |
| 13611 | Flat rate supplementary fee for medical care in the case of peritoneal dialysis |
| 4562  | Flat rate supplementary fee for continuous care of a patient requiring dialysis |
| 4564  | Flat rate supplementary fee for paediatric nephrology care when carrying out haemodialysis |
| 4565  | Flat rate supplementary fee for paediatric nephrology care when carrying out peritoneal dialysis |
| 40815 | Flat rate fee for dialysis in patients up to the age of 18 years at their place of residence |
| 40816 | Flat rate fee for peritoneal dialysis in patients up to the age of 18 years |
| 40817 | Flat rate fee for haemodialysis in patients up to the age of 18 years at their place of residence |
| 40818 | Flat rate fee for peritoneal dialysis in patients up to the age of 18 years during a holiday or other absence |
| 40819 | Flat rate fee for peritoneal dialysis in patients up to the age of 18 years during a holiday or other absence |
| 40823 | Flat rate fee for dialysis in insured persons from the age of 18 years |
| 40824 | Flat rate fee for dialysis in insured persons from the age of 18 years at their place of residence |
| 40825 | Flat rate fee for peritoneal dialysis in insured persons from the age of 18 years |
| 40826 | Flat rate fee for peritoneal dialysis in insured persons from the age of 18 years at their place of residence |
| 40827 | Flat rate fee for intermittent peritoneal dialysis in insured persons from the age of 18 years at their place of residence |
| 40828 | Flat rate fee for dialysis from the age of 18 years during a holiday or work-related stay |
| 40829 | Supplement to flat rate fee 40823 or 40825 for insured persons aged 59-69 years |
| 40830 | Supplement to flat rate fee 40824, 40826 and 40827 for insured persons aged 59-69 years |
| 40831 | Supplement to flat rate fee 40823 or 40825 for insured persons aged 69-79 years |
| 40832 | Supplement to flat rate fee 40824, 40826 and 40827 for insured persons aged 69-79 years |
| Code   | Description                                                                 |
|--------|-----------------------------------------------------------------------------|
| 40833  | Supplement to flat rate fee 40823 or 40825 for insured persons from 79 years of age |
| 40834  | Supplement to flat rate fee 40824, 40826 and 40827 for insured persons from 79 years of age |
| 40835  | Supplement to flat rate fee 40816, 40823 or 40825 for dialysis in a patient with an infection |
| 40836  | Supplement to flat rate fee 40815, 40817, 40818, 40819, 40824, 40826 to 40828 for dialysis in a patient with an infection |
| 40837  | Supplement to flat rate fee 40816 or 40825 for intermittent peritoneal dialysis |
| 40838  | Supplement to flat rate fee 40817, 40819, 40827 or 40828 for intermittent peritoneal dialysis |

**Prior organ transplantation**

ICD-10-GM Codes:

| Z94 | Transplanted organ and tissue status |

OPS Codes:

| 5-504 | Liver transplantation |
| 5-375 | Heart and heart-lung transplantation |
| 5-555 | Kidney transplantation |
| 5-335 | Lung transplantation |
| 5-5281 | Transplantation of a pancreas segment |
| 5-5282 | Transplantation of the pancreas (whole organ) |
| 5-4676 | Small intestine transplantation |

**Prior major surgery**

OPS Codes:

| 5-32 | Excision and resection of lung and bronchus |
| 5-33 | Other operations on lung and bronchus |
| 5-34 | Operations on the chest wall, pleura, mediastinum and diaphragm |
| 5-35 | Operations on the valves and septa of the heart and pericardial vessels |
| 5-36 | Operations on the coronary vessels |
| 5-37 | Surgical treatment of arrhythmias and other operations on the heart and pericardium |
| 8-851 | Bypass surgery (using the heart-lung machine) |
| 5-38 | Incision excision and occlusion of blood vessels |
| 5-39 | Other operations on blood vessels |
| 5-42 | Surgery on the oesophagus |
| 5-43 | Incision, excision and resection of the stomach |
| 5-44 | Extended stomach resection and other operations on the stomach |
| 5-45 | Incision, excision, resection and anastomosis of the small and large intestine |
| 5-46 | Other operations on the small and large intestine |
| 5-47 | Operations on the appendix |
| 5-48 | Operations on the rectum |
| 5-49 | Operations on the anus |
| 5-50 | Operations on the liver |
| 5-51 | Operations on the gallbladder and bile ducts |
| 5-52 | Operations on the pancreas |
|------|---------------------------|
| 5-53 | Abdominal hernia repair   |
| 5-54 | Other operations in the abdominal region |
| 5-78 | Operations on other bones |
| 5-79 | Reduction of fractures and dislocations |
| 5-80 | Open joint surgery         |
| 5-81 | Arthroscopic joint surgery |
| 5-82 | Prosthetic joint and bone replacement |
| 5-83 | Operations on the spine    |
| 5-84 | Operations on the hand     |
| 5-85 | Operations on muscles, tendons, fasciae and bursae |
| 5-86 | Replantation, exarticulation and amputation of extremities and other operations on the organs of locomotion |
| 5-01 | Incision (trepanation) and excision of the skull, brain and meninges |
| 5-02 | Other operations on the skull, brain and meninges |
| 5-03 | Operations on the spinal cord, spinal meninges and spinal canal |
| 5-04 | Operations on the nerves and nerve ganglia |
| 5-05 | Other operations on the nerves and nerve ganglia |
| 5-55 | Operations on the kidneys |
| 5-56 | Operations on the ureters |
| 5-57 | Operations on the bladder |
| 5-58 | Operations on the urethra |
| 5-59 | Other operations on the urinary organs |
| 5-60 | Operations on the prostate and seminal vesicles |
| 5-61 | Operations on the scrotum and tunica vaginalis testis |
| 5-62 | Operations on the testicles |
| 5-63 | Operations on the spermatic cord, epididymis and vas deferens |
| 5-64 | Operations on the penis |
| 5-65 | Operations on the ovary |
| 5-66 | Operations on the fallopian tubes |
| 5-67 | Operations for facial bone fractures |
| 5-68 | Incision, excision and removal of the uterus |
| 5-69 | Other operations on the uterus and operations on the parametria |
| 5-70 | Operations on the vagina and recto-uterine pouch |
| 5-71 | Operations on the vulva |
| 5-72 | Childbirth with breech presentation and instrumental delivery |
| 5-73 | Other operations to induce labour and during the birth |
| 5-74 | Caesarean section and child development |
| 5-75 | Other obstetric operations |
| 5-87 | Excision and resection of the breast |
| 5-88 | Other operations on the breast |
| 8-989 | Surgical complex treatment in cases of severe infection |

Prior palliative treatment
ICD-10-GM Codes:

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| Code   | Description                                                                 |
|--------|-----------------------------------------------------------------------------|
| Z51.5  | Palliative care                                                            |

**OPS:**

| Code   | Description                                                      |
|--------|------------------------------------------------------------------|
| 8-982  | Palliative medical complex treatment                             |
| 8-98e  | Specialized inpatient palliative medical complex treatment       |
| 8-98h  | Specialized palliative medical complex treatment through a palliative care service |

**Statutory scale of fees for physicians (GOÄ) Codes:**

| Code   | Description                                                                 |
|--------|-----------------------------------------------------------------------------|
| 1425   | Initial care in specialized outpatient palliative care                     |
| 1426   | Follow-up prescription for continuation of the specialized outpatient palliative care |
| 3370   | Palliative medical initial diagnosis                                       |
| 3371   | Supplementary fee for palliative medical care in the medical practice       |
| 3372   | Supplementary fee for palliative medical care in the home                   |
| 3373   | Supplementary fee for palliative medical care in the home                   |
| 1425   | Initial prescription for specialized outpatient palliative care             |
| 1426   | Follow-up prescription for continuation of the specialized outpatient palliative care |
| 3370   | Palliative medical initial diagnosis of patient status including treatment plan |
| 3371   | Supplementary fee to the insured persons flat rate 03000 for palliative medical care of the patient in the medical practice |
| 3372   | Supplementary fee to Catalogue of Tariffs for Physicians code 01410 or 01413 for palliative medical care in the home |
| 3373   | Supplementary fee to Catalogue of Tariffs for Physicians code 01411, 01412 or 01415 for palliative medical care in the home |
| 4370   | Palliative medical initial diagnosis                                       |
| 4371   | Supplementary fee to the insured persons flat rate 04000 for palliative medical care of the patient in the medical practice |
| 4372   | Supplementary fee to Catalogue of Tariffs for Physicians code 01410 or 01413 for palliative medical care in the home |
| 4373   | Supplementary fee to Catalogue of Tariffs for Physicians code 01411, 01412 or 01415 for palliative medical care in the home |
| 37302  | Consultation discussion doctor with an additional designation palliative medicine |
| 37314  | Telephone consultation                                                    |
| 37300  | Palliative medical initial diagnosis of patient status including treatment plan |
| 37305  | Supplementary fee to tariff codes 01410 and 01413 for palliative medical care in the home |
| 37306  | Supplementary fee to tariff codes 01411 01412 and 01415 for palliative medical care in the home |
| 37317  | Supplementary fee to tariff code 37302 for accessibility and willingness to visit in critical phases |
| 37320  | Case conference                                                           |

**Pre-existing asplenia coded in the five years prior to sepsis index hospitalization**
Postsepsis morbidity

As data on outpatient diagnoses, cases, case-related therapies and corresponding costs in Germany are available on only a quarterly basis, data from quarters 1-4, 5-8 and 9-12 following the quarter of the index hospitalization discharge date were included in the 12, 24 and 36 month follow-up, respectively.

Both primary and secondary hospital discharge diagnoses as well as outpatient diagnoses labeled as confirmed diagnoses by the treating physicians were included in the definition of post-sepsis diagnoses.

Cognitive impairment

| ICD-10-GM Codes: | Definition |
|-----------------|------------|
| F06.7           | Mild cognitive disorder |
| F01             | Vascular dementia |
| F02*            | Dementia in other diseases classified elsewhere |
| F03             | Unspecified dementia |
| F04             | Organic amnesic syndrome, not induced by alcohol and other psychoactive substances |
| F05             | Delirium, not induced by alcohol and other psychoactive substances |
| F06.9           | Unspecified organic mental disorder due to brain damage and dysfunction and to physical disease |
| F07.8           | Other organic personality and behavioural disorders due to brain disease, damage and dysfunction |
| F07.9           | Unspecified organic personality and behavioural disorder due to brain disease, damage and dysfunction |
| G30             | Alzheimer disease |
| G31.0           | Circumscribed brain atrophy |
| G31.1           | Senile degeneration of brain, not elsewhere classified |
| G31.9           | Degenerative disease of nervous system, unspecified |
| G32*            | Other degenerative disorders of nervous system in diseases classified elsewhere |

Psychological impairment

| ICD-10-GM Codes: | Definition |
|-----------------|------------|
| F43             | Reaction to severe stress, and adjustment disorders |
| Code   | Description                                      |
|--------|--------------------------------------------------|
| F43.0  | Acute stress reaction                            |
| F43.1  | Post-traumatic stress disorder                   |
| F43.2  | Adjustment disorders                              |
| F43.8  | Other reactions to severe stress                 |
| F43.9  | Reaction to severe stress, unspecified           |
|        | Depression                                       |
| F32    | Depressive episode                               |
| F33    | Recurrent depressive disorder                     |
| F34.1  | Dysthymia                                        |
| F38    | Other mood [affective] disorders                 |
| F41.2  | Mixed anxiety and depressive disorder             |
| F06.3  | Organic mood [affective] disorders               |
|        | Anxiety                                           |
| F40    | Phobic anxiety disorders                          |
| F41    | Other anxiety disorders                           |
| F06.4  | Organic anxiety disorder                         |
|        | Sleeping disorders                                |
| F51    | Nonorganic sleep disorders                        |
| G47    | Sleep disorders                                   |
|        | Substance abuse                                   |
| F10    | Mental and behavioural disorders due to use of alcohol |
| F11    | Mental and behavioural disorders due to use of opioids |
| F12    | Mental and behavioural disorders due to use of cannabinoids |
| F13    | Mental and behavioural disorders due to use of sedatives or hypnotics |
| F14    | Mental and behavioural disorders due to use of cocaine |
| F15    | Mental and behavioural disorders due to use of other stimulants, including caffeine |
| F16    | Mental and behavioural disorders due to use of hallucinogens |
| F17    | Mental and behavioural disorders due to use of tobacco |
| F18    | Mental and behavioural disorders due to use of volatile solvents |
| F19    | Mental and behavioural disorders due to multiple drug use and use of other psychoactive substances |
|        | Medical impairment                                |
|        | Respiratory dysfunction                           |
|        | ICD-10-GM Codes:                                  |
| J96    | Respiratory failure, not elsewhere classified     |
| J98    | Other respiratory disorders                       |
| R06.0  | Dyspnoea                                          |
| J80    | Adult respiratory distress syndrome               |

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| Condition                                      | ICD-10-GM Codes                                      |
|-----------------------------------------------|-----------------------------------------------------|
| **Cardiovascular diseases**                   |                                                     |
| Coronary heart disease and myocardial infarction | I20 Angina pectoris                                  |
|                                              | I21 Acute myocardial infarction                     |
|                                              | I22 Subsequent myocardial infarction                |
|                                              | I24 Other acute ischaemic heart diseases            |
|                                              | I25 Chronic ischaemic heart disease                 |
| **Cardiomyopathy**                            |                                                     |
|                                              | I42 Cardiomyopathy                                  |
| **Heart failure**                             |                                                     |
|                                              | I50 Heart failure                                   |
| **Cardiac arrhythmias**                       |                                                     |
|                                              | I47 Paroxysmal tachycardia                          |
|                                              | I48 Atrial fibrillation and flutter                 |
|                                              | I49 Other cardiac arrhythmias                       |
| **Cerebrovascular diseases**                  |                                                     |
|                                              | I63 Cerebral infarction                             |
|                                              | I64 Stroke, not specified as haemorrhage or infarction |
|                                              | I65 Occlusion and stenosis of precerebral arteries, not resulting in cerebral infarction |
|                                              | I66 Occlusion and stenosis of cerebral arteries, not resulting in cerebral infarction |
| **Renal diseases**                            |                                                     |
|                                              | N17 Acute renal failure                             |
|                                              | N18 Chronic kidney disease                          |
|                                              | N19 Unspecified kidney failure                      |
| **Hepatic diseases**                          |                                                     |
|                                              | K72.1 Chronic hepatic failure                       |
| **Metabolic diseases**                        |                                                     |
| Diabetes mellitus                              |                                                     |
|                                              | K72.1 Chronic hepatic failure                       |
| Code | Description |
|------|-------------|
| E11  | Type 2 diabetes mellitus |
| E12  | Malnutrition-related diabetes mellitus |
| E13  | Other specified diabetes mellitus |
| E14  | Unspecified diabetes mellitus |
|      | Other metabolic diseases |
|      | ICD-10-GM Codes: |
| E27  | Other disorders of adrenal gland |
| E35* | Disorders of endocrine glands in diseases classified elsewhere |
| E34.9| Endocrine disorder, unspecified |
| E23  | Hypofunction and other disorders of pituitary gland |

| Anaemia | ICD-10-GM Codes: |
|---------|------------------|
| D50     | Iron deficiency anaemia |
| D51     | Vitamin B12 deficiency anaemia |
| D52     | Folate deficiency anaemia |
| D53     | Other nutritional anaemias |
| D63     | Anaemia in chronic diseases classified elsewhere |
| D64.9   | Anaemia, unspecified |

| Neuromuscular/musculoskeletal diseases | ICD-10-GM Codes: |
|---------------------------------------|------------------|
| G62.8                                 | Critical illness polyneuropathy |
| G72.8                                 | Critical illness myopathy |
| Dyphagia                              | Dysphagia |

| Dysphagia | ICD-10-GM Codes: |
|-----------|------------------|
| R13       | Dysphagia |
| R49       | Voice disturbances |

| Contractures | ICD-10-GM Codes: |
|--------------|------------------|
| M62.4        | Contracture of muscle |
| M24.5        | Contracture of joint |
| M25.6        | Stiffness of joint, not elsewhere classified |
| M21.62       | Acquired Pes equinus |

| Immobility | ICD-10-GM Codes: |
|------------|------------------|
| R26.2      | Difficulty in walking, not elsewhere classified |
| R26.3      | Immobility |
| R29.6      | Tendency to fall, not elsewhere classified |
| Z99.3      | Dependence on wheelchair |
| Code | Description |
|------|-------------|
| Z74.0 | Need for assistance due to reduced mobility |

**Decubitus**

| ICD-10-GM Codes: | Description |
|------------------|-------------|
| L89              | Decubitus ulcer and pressure area |

**Complications of tracheostomy**

| ICD-10-GM Codes: | Description |
|------------------|-------------|
| Z43.0            | Attention to tracheostomy |
| Z93.0            | Tracheostomy status |
| J95.0            | Tracheostomy malfunction |

**Tracheal stenoses**

| ICD-10-GM Codes: | Description |
|------------------|-------------|
| J95.5            | Postprocedural subglottic stenosis |
| J95.81           | Tracheal stenosis following a procedure |
| J38.6            | Stenosis of larynx |
| J39.8            | Acquired tracheal stenosis |

**Urogenital diseases**

**Incontinence**

| ICD-10-GM Codes: | Description |
|------------------|-------------|
| R32              | Unspecified urinary incontinence |
| N39.3            | Stress incontinence |
| N39.4            | Other specified urinary incontinence |
| R15              | Faecal incontinence |

**Sexual disorders**

| ICD-10-GM Codes: | Description |
|------------------|-------------|
| F52              | Sexual dysfunction, not caused by organic disorder or disease |

**Urethral stricture**

| ICD-10-GM Codes: | Description |
|------------------|-------------|
| N99.1            | Postprocedural urethral stricture |

**Sensory disorders**

**Vestibular disorders**

| ICD-10-GM Codes: | Description |
|------------------|-------------|
| R42              | Dizziness and giddiness |

**Hearing disorder**

| ICD-10-GM Codes: | Description |
|------------------|-------------|
| H90              | Conductive and sensorineural hearing loss |
| H91              | Other hearing loss |
| H93              | Other disorders of ear, not elsewhere classified |

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| Taste and smelling disorders | ICD-10-GM Codes: |
|-----------------------------|-----------------|
|                             | R43             |
|                             | Disturbances of smell and taste |

| Impairment of nutrition | ICD-10-GM Codes: |
|-------------------------|-----------------|
|                         | E41             |
|                         | Nutritional marasmus |
|                         | E43             |
|                         | Unspecified severe protein-energy malnutrition |
|                         | E44             |
|                         | Protein-energy malnutrition of moderate and mild degree |
|                         | E46             |
|                         | Unspecified protein-energy malnutrition |
|                         | R63.0           |
|                         | Anorexia |
|                         | R63.3           |
|                         | Feeding difficulties and mismanagement |
|                         | R63.4           |
|                         | Abnormal weight loss |
|                         | R63.6           |
|                         | Insufficient intake of food and water |
|                         | R63.8           |
|                         | Other symptoms and signs concerning food and fluid intake |
|                         | R64             |
|                         | Cachexia |

| Multidrug-resistant infections | ICD-10-GM Codes: |
|-------------------------------|-----------------|
|                               | U80.-!          |
|                               | Gram-positive bacteria with specified antibiotic resistance requiring special therapeutic or hygienic measures |
|                               | U81.-!          |
|                               | Gram-negative bacteria with specified antibiotic resistance requiring special therapeutic or hygienic measures |
|                               | U82             |
|                               | Mycobacteria with resistance against TB drugs (first line) |
|                               | U83             |
|                               | Candida with resistance against Fluconazole and Voriconazole |
|                               | U84             |
|                               | Herpes virus with resistance against antivirals |

| Chronic pain | ICD-10-GM Codes: |
|--------------|-----------------|
|              | R52.1           |
|              | Chronic intractable pain |
|              | R52.2           |
|              | Other chronic pain |
|              | R52.9           |
|              | Pain unspecified |
|              | F45.4           |
|              | Persistent somatoform pain disorder |
|              | F45.41          |
|              | Chronic pain disorder associated with psychological and behavioural factors |
|              | G54.6           |
|              | Phantom limb syndrome with pain |

| Fatigue | ICD-10-GM Codes: |
|---------|-----------------|
|         | R53             |
|         | Malaise and fatigue |
|         | G93.3           |
|         | Chronic fatigue syndrome |
| Long-term mechanical ventilation | ICD-10-GM Codes: |
|----------------------------------|------------------|
| Z99.0                            | Dependence on aspirator |
| Z99.1                            | Dependence on respirator |

OPS Codes:

| Code   | Description                                      |
|--------|--------------------------------------------------|
| 8-713  | Mechanical ventilation and respiratory support in adults |
| 8-716  | Setting up of home mechanical ventilation          |
| 8-718  | Weaning from mechanical ventilation               |

| Dialysis | ICD-10-GM Codes: |
|----------|------------------|
| Z99.2    | Dependence on renal dialysis                       |
| Z49      | Care involving dialysis                            |

OPS Codes:

| Code   | Description                                      |
|--------|--------------------------------------------------|
| 8-853  | Haemofiltration                                   |
| 8-854  | Haemodialysis                                     |
| 8-855  | Haemodiafiltration                                |
| 8-857  | Peritoneal dialysis                               |
| 8-85a  | Dialysis procedure due to a functional failure and failure of a kidney transplant |
### eTable 1. Patient and Hospitalization Characteristics and Outcomes for 159,684 Index Sepsis Hospitalizations

| Characteristics and Outcomes | Patients, % (95% CI) |
|------------------------------|----------------------|
| **Age.**                     | 73.8 (12.8)          |
|                             | 76 (67, 83)          |
| **Female sex**               | 47.5 (47.2 - 47.7)   |
| **Charlson Comorbidity Index,** | 2.1 (1.5)          |
|                             | 2 (1.3)              |
| **Admission as emergency**   | 57.9 (57.6 - 58.1)   |
| **Site of infection***       |                      |
| - Respiratory tract          | 38.5 (38.3 - 38.7)   |
| - Genitourinary system       | 30.6 (30.4 - 30.8)   |
| - Abdominal                  | 16.0 (15.8 - 16.1)   |
| - Device-related             | 7.3 (7.1 - 7.4)      |
| - Wound/soft tissue infection| 6.2 (6.0 - 6.3)      |
| - Cardiovascular system      | 3.5 (3.4 - 3.6)      |
| - Central nervous system     | 0.9 (0.9 - 1.0)      |
| - Pregnancy associated infection | 0.1 (0.1 - 0.1) |
| **Hospital-acquired infection** | 20.9 (20.7 - 21.1) |
| **Multi-drug-resistant infection** | 4.9 (4.8 - 5.0) |
| **Severity of sepsis**       |                      |
| - severe sepsis              | 43.8 (43.6 - 44.1)   |
| - septic shock               | 12.9 (12.7 - 13.1)   |
| **ICU treatment**            | 34.0 (33.8 - 34.2)   |
| **Mechanical ventilation**   | 25.1 (24.9 - 25.3)   |
| **Renal replacement therapy**| 10.3 (10.2 - 10.5)   |
| **Tracheostomy during hospitalization** | 7.4 (7.3 - 7.6) |
| **Surgical treatment (any surgical procedure)** | 35.4 (35.2 - 35.7) |
| **Amputation during hospitalization** | 1.7 (1.7 - 1.8) |
| **Palliative care (complex palliative treatment during hospitalization)** | 1.5 (1.4 - 1.5) |
| **Early rehabilitation treatment (interdisciplinary rehabilitation during hospitalization)** | 3.7 (3.6 - 3.8) |
| **Hospital length of stay**  | 20.6 (20.2 - 20.8)   |
|                             | 14 (8, 26)           |
| **In-Hospital mortality**    | 27.0 (26.8 - 27.3)   |
| **Discharge disposition of survivors** | 72.5 (72.3 - 72.8) |
| - home                      | 12.2 (12.1 - 12.4)   |
| - another acute care hospital| 5.5 (5.4 - 5.6)      |
| - rehabilitation facility    | 8.1 (7.9 - 8.2)      |
| - hospice                   | 0.3 (0.2 - 0.3)      |
| - other                     | 1.4 (1.4 - 1.5)      |
| **Hospital costs**           | 15361 (28731)        |
|                             | 5849 (3474, 13749)   |
| **Health status, utilization and costs during the 12 months prior to sepsis** | |
| **Employed**                | 12.6 (12.5 - 12.8)   |
| **Dependence on chronic care** | 11.7 (11.5 - 11.8) |
| - Nursing home residence     | 38.3 (38.1 - 38.5)   |
| - Pre-existing immobility     | 19.8 (19.6 - 20.0)   |
| - Pre-existing long-term mechanical ventilation | 1.4 (1.3 - 1.4) |
| - Pre-existing dialysis      | 4.3 (4.2 - 4.4)      |
| - Prior organ transplantation | 0.9 (0.8 - 0.9)     |
| **Major surgery in the prior year** | 27.4 (27.2 - 27.6) |
| **Palliative treatment (any inpatient and outpatient palliative care treatment) in the prior year** | 7.3 (7.2 - 7.4) |
| **Pre-existing asplenia**    | 0.4 (0.3 - 0.4)      |
| **Total health costs in the year prior to sepsis** | 13074 (19690) |
|                             | 6327 (2126, 15989)   |
All ICD-based definition for the baseline and index hospitalization characteristics can be found in Supplement 1. Abbreviations: CCI = Charlson Comorbidity Index, unweighted; IQR = Interquartile range; SD = Standard deviation
* eligibility for long-term care benefits in line with the German Social Code, ranging from Grade 1: “Little impairment of independence” up to Grade 5: “Hardship cases”
** Total health care costs include cost for hospitalizations, outpatient consultations, medication, treatments (e.g. physical or occupational therapy) and rehabilitation.
***Defined by ICD code indicating an infectious source, as indicated in methods supplement. Note that multiple sites of infection were possible.
| eTable 2. Baseline Characteristics of Different Patient Groups | Non-severe sepsis | Severe sepsis | ICU-treated sepsis | Non-ICU-treated sepsis | Sepsis patients w/o pre-existing impairments |
|-------------------------------------------------------------|------------------|---------------|-------------------|------------------------|-------------------------------------------|
| n, % (95% CI)                                              | n, % (95% CI)    | n, % (95% CI)  | n, % (95% CI)     | n, % (95% CI)           | n, % (95% CI)                             |
| Patients, % of the total cohort                            | 69,956 (43.8-43.6) | 76 (67, 83) | 34 (33.8-34.2) | 66 (65.8-66.2) | 6.7 (6.6-6.8) |
| Hospital length of stay: mean (SD)                        | 89,728 (56.2-56.4) | 73.8 (13.2) | 71.6 (12.3) | 63.1 (16.3) | 65 (53, 75) |
| Surgical treatment, %                                       | 6,382 (84) | 84 | 2,814 (51.2) | 53,305 (50.6) | 4,450 (41.7) |
| Presence of any acute organ dysfunction, %                 | 8,795 (3.3) | 5,484 (9.5) | 3,157 (5.9) | 3,934 (37.1) | 31 (36.2-38) |
| eTable 2. Baseline Characteristics of Different Patient Groups | 45,788 (76.8) | 2,165 (3.9) | 105,367 (66) | 4,450 (41.7) | 89.3 (88.9) |
| Age: mean (SD); median (IQR)                               | 73.8 (13.2) | 76 (67, 83) | 71.6 (12.3) | 53,305 (50.6) | 4,450 (41.7) |
| Female sex                                                  | 3,382 (3.3) | 2,165 (3.9) | 2,814 (51.2) | 3,934 (37.1) | 31 (36.2-38) |
| CCI: mean (SD); median (IQR)                               | 2,814 (51.2) | 3,157 (5.9) | 3,934 (37.1) | 4,450 (41.7) | 89.3 (88.9) |
| Admission as emergency                                      | 2,165 (3.9) | 105,367 (66) | 4,450 (41.7) | 89.3 (88.9) | 44.7 (43.6-44.8) |
| Focus of infection, %                                       | 105,367 (66) | 4,450 (41.7) | 89.3 (88.9) | 44.7 (43.6-44.8) | 0.8 (0.8-1) |
| - Respiratory tract                                         | 2,165 (3.9) | 105,367 (66) | 4,450 (41.7) | 89.3 (88.9) | 44.7 (43.6-44.8) |
| - Abdominal                                                 | 2,814 (51.2) | 3,157 (5.9) | 3,934 (37.1) | 4,450 (41.7) | 89.3 (88.9) |
| - Wound/soft tissue infection                               | 3,934 (37.1) | 4,450 (41.7) | 89.3 (88.9) | 44.7 (43.6-44.8) | 0.8 (0.8-1) |
| - Genitourinary system                                      | 4,450 (41.7) | 89.3 (88.9) | 44.7 (43.6-44.8) | 0.8 (0.8-1) | 2.9 (2.8-3.0) |
| - Central nervous system                                    | 89.3 (88.9) | 44.7 (43.6-44.8) | 0.8 (0.8-1) | 2.9 (2.8-3.0) | 43 (4.5-8.4) |
| - Cardiovascular system                                     | 44.7 (43.6-44.8) | 0.8 (0.8-1) | 2.9 (2.8-3.0) | 43 (4.5-8.4) | 3,087 (2.9) |
| - Device-related                                            | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) |
| - Pregnancy associated infection                             | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) |
| Hospital-acquired infection, %                              | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) |
| Number of organ dysfunction: mean (SD); median (IQR)        | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) |
| Presence of any acute organ dysfunction, %                  | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) |
| Occurrence of septic shock, %                               | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) |
| ICU treatment, %                                             | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) |
| Mechanical ventilation, %                                   | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) |
| Renal replacement therapy, %                                | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) |
| Tracheostomy during hospitalization, %                      | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) |
| Surgical treatment, %                                       | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) |
| Palliative care, %                                           | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) |
| Early rehabilitation treatment, %                           | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) |
| Hospital length of stay: mean (SD); median (IQR)            | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) |
| Hospital deaths, mortality, %                               | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) |
| Discharge disposition of survivors, %                       | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) |
| - regular discharge                                         | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) |
| - other hospital                                            | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) |
| - rehabilitation                                            | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) | 3,087 (2.9) | 43 (4.5-8.4) |

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|                                | Non-severe sepsis | Severe sepsis | ICU-treated sepsis | Non-ICU-treated sepsis | Sepsis patients w/o pre-existing impairments |
|--------------------------------|-------------------|---------------|-------------------|------------------------|---------------------------------------------|
|                                | n % (95% CI)      | n % (95% CI)  | n % (95% CI)      | n % (95% CI)           | n % (95% CI)                                 |
| **Health status and health care use 12 months prior to index hospitalization** |                   |               |                   |                        |                                             |
| **Employed persons, %**        | 11,865 (13.2 - 13.4) | 8,279 (11.8 - 12.1) | 7,554 (13.9 - 14.2) | 12,590 (11.9 - 12.1) | 3,919 (13.3 - 13.4)                        |
| **Dependence on chronic care** |                   |               |                   |                        |                                             |
| - Nursing home residence, %    | 10,591 (11.8 - 11.6) | 8,045 (11.5 - 11.7) | 4,058 (4.5 - 7.7)  | 14,578 (13.8 - 14.0) | 96 (0.7 - 1.1)                             |
| - Care level per German care level system**, % | 34,364 (38.3 - 38.6) | 26,803 (38.3 - 38.7) | 16,951 (31.2 - 30.8) | 44,216 (42.1 - 43.2) | 626 (5.4 - 6.3)                            |
| - Pre-existing immobility, %   | 17,490 (19.5 - 19.8) | 14,167 (20.3 - 20.6) | 9,184 (16.9 - 17.2) | 22,473 (21.3 - 21.6) | 0 (0 - 0)                                  |
| - Pre-existing long-term mechanical ventilation, % | 1,024 (1.1 - 1.2) | 1,132 (1.6 - 1.7) | 1,073 (2.0 - 1.9) | 1,083 (1.1 - 1.1) | 0 (0 - 0)                                  |
| - Pre-existing dialysis, %     | 3,453 (3.8 - 4) | 3,340 (4.8 - 4.9) | 2,865 (5.3 - 5.5) | 3,928 (3.7 - 3.8) | 3 (0 - 0)                                  |
| - Prior organ transplantation, % | 704 (0.8 - 0.8) | 708 (1.0 - 1.1) | 580 (1.1 - 1.0) | 832 (0.8 - 0.8) | 26 (0.2 - 0.3)                             |
| - Prior major surgery, %       | 24,786 (27.6 - 27.9) | 18,986 (27.1 - 27.5) | 14,791 (27.2 - 27.6) | 28,981 (27.5 - 27.8) | 992 (9.3 - 8.9)                            |
| - Prior palliative treatment, % | 6,637 (7.4 - 7.6) | 5,046 (7.2 - 7.4) | 2,945 (5.4 - 5.6) | 8,738 (8.3 - 8.5) | 252 (2.4 - 2.7)                            |
| - Pre-existing asplenia, coded in the five years prior to sepsis index hospitalization, % | 343 (0.4 - 0.4) | 241 (0.3 - 0.4) | 206 (0.4 - 0.4) | 378 (0.4 - 0.4) | 12 (0.1 - 0.2)                             |
| **Total health care costs [e]****, mean (SD); median (IQR)** | 12,982 (19,255); 6,194 (2,066, 15,891) | 13,192 (20,233); 6,495 (2,203, 16,114) | 13,344 (21,175); 6,141 (1,992, 15,995) | 12,935 (18,877); 6,423 (2,194, 15,985) | 3,089 (9,001); 443 (70, 1,869) |

* any ICD-10 code for organ dysfunction, not necessarily linked to infection/sepsis, as the coding of organ dysfunction in sepsis patients is not mandatory in Germany
** eligibility for long-term care benefits in line with the German Social Code
*** Total health care costs include cost for hospitalizations, outpatient consultations, medication and treatments (e.g. physical or occupational therapy) and rehabilitation.

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eTable 3. Underlying Diseases in the Psychological and Medical Domain

| Follow-Up after index admission | 1-12 months | 13-24 months | 25-36 months |
|---------------------------------|-------------|--------------|--------------|
| Sepsis survivors, n             | 116,507     | 80,742       | 68,940       |

1. Medical Diagnoses

- Prevalence of physical diagnoses
  - Respiratory dysfunction
  - Cardiovascular diseases
  - Coronary heart disease and myocardial infarction
  - Cardiomyopathy
  - Heart failure
  - Cardiac arrhythmias
  - Cerebrovascular diseases
  - Renal diseases
  - Hepatic diseases
  - Metabolic diseases
  - Renal diseases
  - Cardiac arrhythmias
  - Heart failure
  - Cardiomyopathy
  - Diabetes mellitus
  - Renal diseases
  - Hepatic diseases
  - Metabolic diseases
  - Renal diseases
  - Cardiac arrhythmias
  - Heart failure
  - Cardiomyopathy
  - Diabetes mellitus
  - Renal diseases
  - Hepatic diseases
  - Metabolic diseases
  - Renal diseases
  - Cardiac arrhythmias
  - Heart failure
  - Cardiomyopathy
  - Diabetes mellitus
  - Renal diseases
  - Hepatic diseases
  - Metabolic diseases
  - Renal diseases
  - Cardiac arrhythmias
  - Heart failure
  - Cardiomyopathy
  - Diabetes mellitus

- Incidence of new medical diagnoses
  - Fatigue
  - Multi
  - Taste and smelling disorders
  - Vestibular disorders
  - Sexual disorders
  - Incontinence
  - Tracheal stenoses
  - Complications of the tracheostoma

- Incidence of new medical diagnoses, n, % of population at risk
  - Respiratory dysfunction
  - Cardiovascular diseases
  - Cardiac arrhythmias
  - Heart failure
  - Cardiomyopathy
  - Diabetes mellitus
  - Renal diseases
  - Hepatic diseases
  - Metabolic diseases
  - Renal diseases
  - Cardiac arrhythmias
  - Heart failure
  - Cardiomyopathy
  - Diabetes mellitus
  - Renal diseases
  - Hepatic diseases
  - Metabolic diseases
  - Renal diseases
  - Cardiac arrhythmias
  - Heart failure
  - Cardiomyopathy
  - Diabetes mellitus
  - Renal diseases
  - Hepatic diseases
  - Metabolic diseases
  - Renal diseases
  - Cardiac arrhythmias
  - Heart failure
  - Cardiomyopathy
  - Diabetes mellitus
  - Renal diseases
  - Hepatic diseases
  - Metabolic diseases
  - Renal diseases
  - Cardiac arrhythmias
  - Heart failure
  - Cardiomyopathy
  - Diabetes mellitus
  - Renal diseases
  - Hepatic diseases
  - Metabolic diseases
  - Renal diseases
  - Cardiac arrhythmias
  - Heart failure
  - Cardiomyopathy
  - Diabetes mellitus
  - Renal diseases
  - Hepatic diseases
  - Metabolic diseases
  - Renal diseases
  - Cardiac arrhythmias
  - Heart failure
  - Cardiomyopathy
  - Diabetes mellitus

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### eTable 3. Underlying Diseases in the Psychological and Medical Domain

| Follow-Up after index admission | 1-12 months | 13-24 months | 25-36 months |
|---------------------------------|-------------|--------------|--------------|
| **n**                           | % (95 % CI) | % (95 % CI)  | % (95 % CI)  |
| **decubitus**                   | 14,832      | 13.9 (13.7 - 14.1) | 4,460      | 6.4 (6.2 - 6.6) | 3,891 | 6.3 (6.1 - 6.5) |
| **Complications of the tracheostoma** | 859         | 0.7 (0.7 - 0.8) | 182         | 0.2 (0.2 - 0.3) | 97   | 0.1 (0.1 - 0.2) |
| **tracheal stenoses**           | 362         | 0.3 (0.3 - 0.3) | 129         | 0.2 (0.1 - 0.2) | 68   | 0.1 (0.1 - 0.1) |
| **urogenital diseases**         | 20,510      | 25.4 (25.1 - 15.7) | 6,688      | 13.6 (13.3 - 13.9) | 5,728 | 13.0 (12.7 - 13.3) |
| **incontinence**                | 20,480      | 24.7 (24.4 - 25.0) | 6,498      | 12.8 (12.5 - 13.1) | 5,566 | 12.3 (12.0 - 12.6) |
| **sexual disorders**            | 614         | 0.5 (0.5 - 0.5) | 428         | 0.5 (0.5 - 0.6) | 359   | 0.5 (0.5 - 0.6) |
| **urethral stricture**          | 164         | 0.1 (0.1 - 0.2) | 83          | 0.1 (0.1 - 0.1) | 63    | 0.1 (0.1 - 0.1) |
| **urogenital diseases**         | 10,879      | 12.5 (12.3 - 12.7) | 6,234      | 10.6 (10.4 - 10.9) | 5,370 | 10.6 (10.4 - 10.9) |
| **vestibular disorders**        | 6,627       | 6.4 (6.2 - 6.5) | 3,682      | 5.2 (5.0 - 5.4) | 3,117 | 5.1 (5.0 - 5.3) |
| **hearing disorder**            | 7,197       | 7.5 (7.4 - 7.7) | 4,455      | 6.8 (6.6 - 7.0) | 3,861 | 6.8 (6.6 - 7.1) |
| **taste and smelling disorders**| 137         | 0.1 (0.1 - 0.1) | 80         | 0.1 (0.1 - 0.1) | 65    | 0.1 (0.1 - 0.1) |
| **Impairment of nutrition**     | 13,251      | 12.6 (12.4 - 12.8) | 4,853      | 6.8 (6.6 - 7.0) | 4,000 | 6.3 (6.1 - 6.5) |
| **chronic pain**                | 12,416      | 12.9 (12.7 - 13.1) | 6,586      | 10.5 (10.3 - 10.8) | 5,671 | 10.9 (10.7 - 11.2) |
| **multi-resistant infections**  | 13,189      | 12.0 (11.8 - 12.2) | 3,835      | 5.4 (5.2 - 5.6) | 3,077 | 4.8 (4.7 - 5.0) |
| **fatigue**                     | 8,925       | 8.2 (8.1 - 8.4) | 4,305      | 5.8 (5.7 - 6.0) | 3,604 | 5.6 (5.4 - 5.8) |

### 2. Psychological Diagnoses

* Prevalence of psychological diagnoses

| **PTSD** | 431 | 0.4 (0.3 - 0.4) | 377   | 0.5 (0.4 - 0.5) | 368   | 0.5 (0.5 - 0.6) |
| **Depression** | 31,953 | 27.4 (27.2 - 27.7) | 24,550 | 30.4 (30.1 - 30.7) | 21,367 | 31.0 (30.6 - 31.3) |
| **Anxiety** | 8,192 | 7.0 (6.9 - 7.2) | 6,506   | 9.1 (7.9 - 8.2) | 5,653 | 8.2 (8.0 - 8.4) |
| **Sleeping disorders** | 17,058 | 14.6 (14.4 - 14.8) | 12,923 | 16 (15.8 - 16.3) | 11,180 | 16.2 (15.9 - 16.5) |
| **Substance abuse** | 15,142 | 13.0 (12.8 - 13.2) | 11,358 | 14.1 (13.8 - 14.3) | 9,876 | 14.3 (14.1 - 14.6) |

* Incidence of new psychological diagnoses, n, % of population at risk

| **PTSD** | 211 | 0.2 (0.2 - 0.2) | 121   | 0.2 (0.1 - 0.2) | 109   | 0.2 (0.1 - 0.2) |
| **Depression** | 9,878 | 11.7 (11.5 - 11.9) | 4,276 | 7.7 (7.5 - 7.9) | 3,388 | 7.1 (6.9 - 7.4) |
| **Anxiety** | 3,550 | 3.3 (3.2 - 3.4) | 1,983   | 2.7 (2.6 - 2.8) | 1,585 | 2.5 (2.4 - 2.6) |
| **Sleeping disorders** | 6,833 | 6.9 (6.8 - 7.1) | 3,569   | 5.3 (5.2 - 5.5) | 2,880 | 5.0 (4.8 - 5.2) |
| **Substance abuse** | 4,103 | 4.1 (4.0 - 4.2) | 1,868   | 2.7 (2.6 - 2.8) | 1,635 | 2.8 (2.6 - 2.9) |
# Table 4. Prevalent and Incident Impairments in Hospital Survivors, 1 to 12, 13 to 24, and 25 to 36 Months After Sepsis Follow-Up after index admission

| Survivors, n | 1-12 months | % (95% CI) | 13-24 months | % (95% CI) | 25-36 months | % (95% CI) |
|--------------|-------------|------------|--------------|------------|--------------|------------|
| 1. Medical impairment | 116,507 | 87.6 (87.4 - 87.8) | 80,742 | 91.4 (91.2 - 91.6) | 68,840 | 91.2 (91.2 - 91.4) |
| - Prevalence of medical impairment, n, % of survivors | 102,018 | 87.6 (87.4 - 87.8) | 73,828 | 91.4 (91.2 - 91.6) | 62,896 | 91.2 (91.2 - 91.4) |
| - New onset of medical impairments, n, % of survivors | 82,629 | 70.9 (70.7 - 71.2) | 49,486 | 61.3 (61.1 - 61.6) | 37,885 | 55.0 (54.6 - 55.3) |
| - Number of new onset diseases, mean (SD); median (IQR) | 1.9 (1.9); 1 (0, 3) | 1.4 (1.6); 1 (0, 2) | 1.1 (1.4); 1 (0, 2) |
| 2. Psychological impairment | 50,950 | 43.7 (43.4 - 44) | 38,598 | 47.8 (47.5 - 48.1) | 33,431 | 48.5 (48.1 - 48.9) |
| - Prevalence of psychological impairment, n, % of survivors | 50,950 | 43.7 (43.4 - 44) | 38,598 | 47.8 (47.5 - 48.1) | 33,431 | 48.5 (48.1 - 48.9) |
| - New onset of psychological impairment, n, % of survivors | 20,840 | 17.9 (17.7 - 18.1) | 10,296 | 12.8 (12.5 - 13) | 8,429 | 12.2 (12 - 12.5) |
| 3. Cognitive impairment | 37,275 | 32 (31.7 - 32.3) | 25,352 | 31.4 (31.1 - 31.7) | 21,425 | 31.1 (30.7 - 31.4) |
| - Prevalence of cognitive impairment, n, % of survivors at risk | 15,955 | 18.5 (18.2 - 18.7) | 5,383 | 9.8 (9.5 - 10) | 4,807 | 9.8 (9.6 - 10.1) |
| 4. Dependency on chronic care | 22,468 | 19.3 (19.1 - 19.5) | 15,149 | 18.8 (18.5 - 19.0) | 12,676 | 18.4 (18.1 - 18.7) |
| - Nursing home residence, % | 22,468 | 19.3 (19.1 - 19.5) | 15,149 | 18.8 (18.5 - 19.0) | 12,676 | 18.4 (18.1 - 18.7) |
| - Care level according to German care level system*, % | 58,209 | 50.0 (49.7 - 50.2) | 40,936 | 50.7 (50.4 - 51.0) | 35,577 | 51.6 (51.2 - 52.0) |
| - New nursing home residence, % of survivors at risk | 12,485 | 12.0 (11.8 - 12.2) | 2,223 | 3.3 (3.2 - 3.5) | 1,950 | 3.4 (3.3 - 3.5) |
| - New care level according to German care level system*, % of survivors at risk | 23,572 | 31.5 (31.1 - 31.8) | 3,784 | 9.2 (9.0 - 9.5) | 4,272 | 11.8 (11.5 - 12.1) |
| 5. Total health care costs | 14,891 (24,737); 7,055 (24,737) | 11,503 (20,788); 5,040 (1,909, 12,813) | 10,521 (19,146); 4,607 (1,771, 11,573) | 11,503 (20,788); 5,040 (1,909, 12,813) | 10,521 (19,146); 4,607 (1,771, 11,573) |

IQR = Interquartile range; SD = Standard deviation
* eligibility for long-term care benefits in line with the German Social Code
** Total health care costs include cost for hospitalizations, outpatient consultations, medication and treatments (e.g. physical or occupational therapy) and rehabilitation.
### eTable 5. Comparison of Outcomes and Costs 1 to 12, 13 to 24, and 25 to 36 Months Among Survivors With Nonsevere and Severe Sepsis

| Follow-up       | 1-12 months | 13-24 months | 25-36 months |
|-----------------|-------------|--------------|--------------|
|                 | % (95% CI)  | % (95% CI)   | % (95% CI)   |

#### 1. Medical impairment
- Prevalence of medical impairment, n, % of survivors
  - Non-severe sepsis: 6,931 (81.8 - 88.3)
  - Severe sepsis: 32,707 (82.4 - 86.8)
  - p-value < 0.001
- New onset of medical impairments, n, % of survivors
  - Non-severe sepsis: 55,094 (70.9 - 70.4)
  - Severe sepsis: 27,535 (72.3 - 73.2)
  - p-value < 0.001

#### 2. Psychological impairment
- Prevalence of psychological impairment, n, % of survivors
  - Non-severe sepsis: 34,278 (43.6 - 43.9)
  - Severe sepsis: 16,672 (44.1 - 44.6)
  - p-value 0.189
- New onset of psychological impairments, n, % of survivors
  - Non-severe sepsis: 13,665 (17.1 - 17.6)
  - Severe sepsis: 7,175 (19.8 - 19.4)
  - p-value < 0.001

#### 3. Cognitive impairment
- Prevalence of cognitive impairment, n, % of survivors
  - Non-severe sepsis: 25,316 (32.2 - 32.5)
  - Severe sepsis: 11,959 (31.6 - 32.1)
  - p-value 0.061
- Incidence of cognitive impairment, n, % of population at risk
  - Non-severe sepsis: 10,278 (17.5 - 17.6)
  - Severe sepsis: 5,677 (19.9 - 20.4)
  - p-value < 0.001

#### 4. Co-occurrence of cognitive/psychological and medical impairments
- Prevalent impairments in two domains, n, % of survivors
  - Non-severe sepsis: 31,398 (39.6 - 40.3)
  - Severe sepsis: 15,095 (39.9 - 40.4)
  - p-value 0.951
- Prevalent impairments in all three domains, n, % of survivors
  - Non-severe sepsis: 13,279 (16.9 - 17.1)
  - Severe sepsis: 6,497 (17.2 - 17.6)
  - p-value 0.221

#### 5. Dependence on chronic care
- Nursing home residence, %
  - Non-severe sepsis: 15,013 (19.1 - 19.4)
  - Severe sepsis: 7,665 (19.7 - 20.1)
  - p-value 0.013
- Care level according to German care level system*, %
  - Non-severe sepsis: 39,206 (49.5 - 50.2)
  - Severe sepsis: 19,003 (50.2 - 50.7)
  - p-value 0.225

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**Table 5. Comparison of Outcomes and Costs 1 to 12, 13 to 24, and 25 to 36 Months Among Survivors With Nonsevere and Severe Sepsis**

| Follow-up | % (95% CI) | % (95% CI) | % (95% CI) |
|-----------|------------|------------|------------|
| 1-12 months | | | |
| Non-severe sepsis | 14,372 (24,289) | 11,057 (20,579) | 10,205 (19,339) |
| Severe sepsis | 15,969 (25,610) | 12,498 (21,213) | 11,226 (18,687) |
| p-value | <0.001 | <0.001 | <0.001 |

**6. Health care costs**
- Total health care costs**, mean (SD)

SD = Standard deviation
* eligibility for long-term care benefits in line with the German Social Code
** Total health care costs include cost for hospitalizations, outpatient consultations, medication and treatments (e.g. physical or occupational therapy) and rehabilitation.
### Table 6. Comparison of Outcomes and Costs 1 to 12, 13 to 24, and 25 to 36 Months Among Patients Treated in the ICU and Those Not Treated in the ICU

| Follow-up | 1-12 months | 13-24 months | 25-36 months |
|-----------|-------------|--------------|--------------|
| n         | % (95% CI)  | n            | % (95% CI)   | n            | % (95% CI)   |

#### 1. Medical diagnosis

- **Prevalence of medical diagnosis, n, % of survivors**
  - Non-ICU-treated sepsis: 73,907 out of 87.7 (87.5 - 87.9) vs. 53,559 out of 91.1 (90.9 - 91.4), p < 0.001<br>
  - ICU-treated sepsis: 28,111 out of 87.2 (86.8 - 87.6) vs. 20,270 out of 92.2 (91.9 - 92.6), p = 0.019

- **New onset of medical diagnosis, n, % of survivors**
  - Non-ICU-treated sepsis: 55,369 out of 69.3 (69 - 69.6) vs. 35,984 out of 61.2 (60.8 - 61.6), p = 0.001
  - ICU-treated sepsis: 24,260 out of 75.3 (74.8 - 75.7) vs. 13,502 out of 61.4 (60.8 - 62.1), p < 0.001

#### 2. Psychological diagnosis

- **Prevalence of psychological diagnosis, n, % of survivors**
  - Non-ICU-treated sepsis: 35,915 out of 42.6 (42.3 - 43.0) vs. 27,240 out of 46.4 (46.0 - 46.8), p = 0.019
  - ICU-treated sepsis: 15,035 out of 46.6 (46.1 - 47.2) vs. 11,358 out of 51.7 (51.0 - 52.3), p = 0.005

- **New onset of psychological diagnosis, n, % of survivors**
  - Non-ICU-treated sepsis: 13,937 out of 16.5 (16.3 - 16.8) vs. 7,309 out of 12.4 (12.2 - 12.7), p = 0.005
  - ICU-treated sepsis: 6,903 out of 21.4 (21.0 - 21.9) vs. 2,987 out of 13.6 (13.1 - 14.0), p < 0.001

#### 3. Cognitive diagnosis

- **Prevalence of cognitive diagnosis, n, % of survivors**
  - Non-ICU-treated sepsis: 28,011 out of 33.2 (32.9 - 33.6) vs. 19,329 out of 32.9 (32.5 - 33.3), p < 0.001
  - ICU-treated sepsis: 9,264 out of 28.7 (28.2 - 29.2) vs. 6,023 out of 27.4 (26.8 - 28.0), p = 0.005

- **Incidence of cognitive diagnosis, n, % of population at risk**
  - Non-ICU-treated sepsis: 10,728 out of 17.8 (17.4 - 18.1) vs. 3,938 out of 9.9 (9.7 - 10.2), p = 0.001
  - ICU-treated sepsis: 5,227 out of 20.2 (19.7 - 20.7) vs. 1,445 out of 9.3 (8.8 - 9.8), p < 0.001

#### 4. Co-occurrence of cognitive/psychological and medical diagnoses

- **Prevalent diagnoses in two domains, n, % of survivors**
  - Non-ICU-treated sepsis: 33,300 out of 39.5 (39.2 - 39.8) vs. 24,539 out of 41.8 (41.4 - 42.2), p = 0.019
  - ICU-treated sepsis: 13,193 out of 40.9 (40.4 - 41.5) vs. 9,695 out of 44.1 (43.5 - 44.8), p = 0.005

- **Prevalent diagnoses in all three domains, n, % of survivors**
  - Non-ICU-treated sepsis: 14,509 out of 17.2 (17.0 - 17.5) vs. 10,276 out of 12.2 (12.0 - 12.4), p = 0.005
  - ICU-treated sepsis: 5,267 out of 16.3 (15.9 - 16.7) vs. 5,356 out of 11.9 (10.7 - 11.4), p < 0.001

- **New onset of diagnoses in two domains, n, % of survivors**
  - Non-ICU-treated sepsis: 16,162 out of 19.2 (18.9 - 19.4) vs. 8,765 out of 14.9 (14.6 - 15.2), p = 0.001
  - ICU-treated sepsis: 7,802 out of 24.2 (23.7 - 24.7) vs. 3,495 out of 15.9 (15.4 - 16.4), p < 0.001

- **New onset of diagnoses in all three domains, n, % of survivors**
  - Non-ICU-treated sepsis: 2,763 out of 3.3 (3.2 - 3.4) vs. 1,096 out of 1.8 (1.8 - 2), p = 0.019
  - ICU-treated sepsis: 1,676 out of 5.2 (5.5 - 5.5) vs. 462 out of 2.1 (1.9 - 2.3), p < 0.001

#### 5. Dependence on nursing care

- **Nursing home residence, %**
  - Non-ICU-treated sepsis: 16,840 out of 20.0 (19.7 - 20.3) vs. 11,496 out of 19.6 (19.2 - 19.9), p = 0.005
  - ICU-treated sepsis: 5,628 out of 17.5 (17.0 - 17.9) vs. 3,683 out of 16.6 (16.1 - 17.1), p < 0.001

- **Care level according to German care level system**, %
  - Non-ICU-treated sepsis: 42,305 out of 50.2 (49.9 - 50.5) vs. 29,704 out of 50.5 (50.1 - 50.1), p = 0.005
  - ICU-treated sepsis: 15,904 out of 49.3 (48.8 - 49.9) vs. 11,232 out of 51.0 (50.4 - 51.8), p < 0.001

#### 6. Health care costs

- **Total health care costs**, mean (SD)
  - Non-ICU-treated sepsis: 13,682 (23.214) vs. 10,831 (19.764) vs. 10,020 (17.905)
  - ICU-treated sepsis: 18,051 (28.090) vs. 13,300 (23.213) vs. 11,857 (22.062)

*p = Standard deviation; **eligibility for long-term care benefits in line with the German Social Code; Total health care costs include cost for hospitalizations, outpatient consultations, medication and treatments (e.g. physical or occupational therapy) and rehabilitation.*
# eTable 7. Outcomes and Costs 1 to 12, 13 to 24, and 25 to 36 Months Among Patients Without Preexisting Impairments

| Follow-up | 1-12 months | 13-24 months | 25-36 months |
|-----------|-------------|--------------|--------------|
| n | n (95% CI) | n (95% CI) | n (95% CI) |
| **Survivors, n** | 8,622 | 7,314 | 6,869 |
| **1. Medical diagnosis** | | | |
| - Prevalence of medical diagnosis, n, % of survivors | 5,472 | 4,382 | 4,236 |
| | (63.5 (62.4 - 64.5)) | (59.9 (58.8 - 61)) | (61.7 (60.5 - 62.8)) |
| - New onset of medical diagnosis, n, % of survivors | 2,942 | 2,437 |
| | (40.2 (39.1 - 41.4)) | (35.5 (34.4 - 36.6)) |
| **2. Psychological diagnosis** | | | |
| - Prevalence of psychological diagnosis, n, % of survivors | 2,157 | 1,820 | 1,790 |
| | (25 (24.1 - 25.9)) | (24.9 (23.9 - 25.9)) | (26.1 (25 - 27.1)) |
| - New onset of psychological diagnosis, n, % of survivors | 880 | 685 |
| | (12 (11.3 - 12.8)) | (10 (9.3 - 10.7)) |
| **3. Cognitive diagnosis** | | | |
| - Prevalence of cognitive diagnosis, n, % of survivors | 1,106 | 834 | 818 |
| | (12.8 (12.1 - 13.6)) | (11.4 (10.7 - 12.2)) | (11.9 (11.2 - 12.7)) |
| - Incidence of cognitive diagnosis, n, % of survivors at risk | 1,106 | 834 |
| | (4.5 (4.0 - 5.0)) | (4.0 (3.7 - 5.0)) |
| **4. Co-occurrence of cognitive/psychological and medical diagnosis** | | | |
| - Prevalent diagnoses in two domains, n, % of survivors | 1,905 | 1,543 | 1,501 |
| | (22.1 (21.2 - 23)) | (21.1 (20.2 - 22)) | (21.9 (20.9 - 22.8)) |
| - Prevalent diagnoses in all three domains, n, % of survivors | 462 | 320 | 331 |
| | (5.4 (4.9 - 5.9)) | (4.4 (3.9 - 4.9)) | (4.8 (4.3 - 5.4)) |
| - New onset of diagnoses in two domains, n, % of survivors | 1,905 | 679 | 526 |
| | (22.1 (21.2 - 23)) | (9.3 (8.6 - 10)) | (7.7 (7.1 - 8.3)) |
| - New onset of diagnoses in all three domains, n, % of survivors | 462 | 65 |
| | (5.4 (4.9 - 5.9)) | (0.9 (0.7 - 1.1)) | (0.6 (0.4 - 0.8)) |
| **5. Dependency on chronic care** | | | |
| - Nursing home residence, % | 663 | 466 | 459 |
| | (7.7 (7.1 - 8.3)) | (6.4 (5.8 - 7)) | (6.7 (6.1 - 7.3)) |
| - Care level according to German care level system*, % | 1,979 | 1,489 | 1,489 |
| | (23 (22.1 - 23.9)) | (20.5 (19.6 - 21.4)) | (21.7 (20.7 - 22.7)) |
| - New nursing home residence, % survivors at risk | 615 | 91 | 88 |
| | (7.2 (6.7 - 7.8)) | (1.3 (1.1 - 1.6)) | (1.4 (1.1 - 1.7)) |
| - New care level according to German care level system*, % survivors at risk | 1,582 | 216 | 283 |
| | (19.3 (18.5 - 20.2)) | (3.7 (3.2 - 4.2)) | (5.1 (4.5 - 5.7)) |
| **6. Total health care costs** | | | |
| Total health care costs [€]**, mean (SD); median (IQR) | 12,583 (25,932); 3,716 (812, 12,696) | 7,004 (20,972); 1,486 (481, 5,741) | 5,621 (14,215); 1,312 (469, 4,569) |

IQR=interquartile range; SD=standard deviation; * eligibility for long-term care benefits in line with the German Social Code; ** Total health care costs include cost for hospitalizations, outpatient consultations, medication and treatments (e.g. physical or occupational therapy) and rehabilitation.

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eTable 8: Total health care costs hospital survivors, 1-12, 13-24 and 25-36 months after sepsis

|                      | Sepsis                | Severe Sepsis           | Non-Severe Sepsis          |
|----------------------|-----------------------|-------------------------|---------------------------|
|                      | n; mean (SD); median (IQR) |                        |                          |
| 12 months prior to index | 116,507; 12,451 (18,767); 5,893 (1,954, 15,074) | 37,840; 12,243 (18,833); 5,891 (1,954, 14,723) | 78,667; 12,550 (18,734); 5,895 (1,954, 15,278) |
| Index hospitalization | 116,507; 13,601 (26,281); 5,514 (3,471, 11,027) | 37,840; 22,636 (36,943); 8,752 (4,673, 26,152) | 78,667; 9,255 (17,559); 4,185 (3,362, 8,043) |
| 12 months after index | 116,507; 14,891 (24,737); 7,055 (2,422, 17,379) | 37,840; 15,969 (25,610); 7,736 (2,536, 18,933) | 78,667; 14,372 (24,289); 6,763 (2,368, 16,625) |
| 24 months after index | 80,742; 11,503 (20,788); 5,040 (1,909, 12,813) | 25,020; 12,498 (21,213); 5,638 (2,138, 14,194) | 55,722; 11,057 (20,579); 4,784 (1,823, 12,176) |
| 36 months after index | 68,940; 10,521 (19,146); 4,607 (1,771, 11,573) | 21,313; 11,226 (18,687); 5,058 (1,943, 12,789) | 47,627; 10,205 (19,339); 4,419 (1,706, 11,040) |
| Total costs 0-36 months follow up* | 116,507; 29,088 (44,195); 15,903 (6,004, 34,568) | 37,840; 30,555 (43,815); 16,893 (5,866, 37,452) | 78,667; 28,383 (44,359; 15,505 (6,069, 33,206) |

IQR = Interquartile range; SD = Standard deviation; *Total health care costs include cost for hospitalizations, outpatient consultations, medication and treatments (e.g. physical or occupational therapy) and rehabilitation.
**eFigure 1.** Co-occurrence and Mortality in Patients 1 to 12 Months After Discharge From the Index Hospitalization According to Preexisting Impairments

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eFigure 2. Kaplan Meier Survival Curve Until 36 Months After Discharge
eFigure 3. Hazard Functions for Death for All Patients With Sepsis, Patients With Severe and Nonsevere Sepsis, Patients Treated in the ICU and Not Treated in the ICU, Patients with Sepsis According to Preexisting Impairments and by Age Groups
