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HEALTHCARE COST AND UTILIZATION PROJECT

**NON-MATERNAL AND NON-NEONATAL INPATIENT STAYS IN THE
UNITED STATES INVOLVING MALNUTRITION
2016**

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INTRODUCTION

Recent estimates indicate that 7 percent of non-maternal and non-neonatal inpatient stays in the United States are for patients with malnutrition (undernutrition).¹ Adult hospitalizations with a diagnosis of malnutrition have a longer length of stay, higher costs, more comorbidities, and 5 times the likelihood of death, compared with other adult inpatient stays.² Additionally, malnutrition may also contribute to *posthospital syndrome*, described as “an acquired, transient period of vulnerability” following hospitalization,³ which may dramatically increase risk of readmission.^{4,5}

Undernutrition is a form of malnutrition characterized by a lack of adequate calories, protein, or other nutrients needed for tissue maintenance and repair.⁶ There are many causes of malnutrition.^{7,8} Some cases involve chronic starvation related to conditions such as anorexia nervosa. In other instances, malnutrition may be a consequence of an acute or chronic illness or injury, such as burns or cancer. Evidence suggests that early nutritional intervention may reduce complication rates, mortality, and resource use associated with malnutrition. However, many cases of malnutrition are unrecognized and untreated.⁹ Clinical definitions of malnutrition and the set of diagnostic codes used to identify malnutrition in hospital administrative data have varied.¹⁰ Standardizing definitions and treatment protocols for malnutrition is complicated by the fact that its etiology is heterogeneous. Using a consistent set of diagnostic criteria and understanding the diseases that are associated with malnutrition are important for recognizing and treating malnutrition, as well as tracking its incidence, prevalence, and outcomes.¹¹

This report, funded by the Agency for Healthcare Research and Quality (AHRQ), is a follow-up to the 2013 national estimates of inpatient stays for malnutrition published in previous

¹ Weiss AJ, Fingar KR, Barrett ML, Elixhauser A, Steiner CA, Guenter P, et al. Characteristics of Hospital Stays Involving Malnutrition, 2013. HCUP Statistical Brief #210. September 2016. Agency for Healthcare Research and Quality, Rockville, MD. <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb210-Malnutrition-Hospital-Stays-2013.pdf>. Accessed August 15, 2018.

² Ibid.

³ Krumholz HM. Post-hospital syndrome—an acquired, transient condition of generalized risk. *New England Journal of Medicine*. 2013;368(2):100–2.

⁴ Suaer A, Luo M. Role of Malnutrition in Increasing Risk of Hospital Readmissions. Abbot Nutrition Health Institute. December 2015. <http://static.abbottnutrition.com/cms-prod/anh.org/img/Role-Of-Malnutrition-In-Increasing-Risk-Of-Hospital-Readmissions-article.pdf>. Accessed September 13, 2016.

⁵ Guenter P, Jensen G, Patel V, Miller S, Mogensen KM, Malone A, et al. Addressing disease-related malnutrition in hospitalized patients: a call for a national goal. *Joint Commission Journal on Quality and Patient Safety*. 2015;41(10):469–73.

⁶ White JV, Guenter P, Jensen G, Malone A, Schofield M, Academy Malnutrition Work Group, et al. Consensus statement: Academy of Nutrition and Dietetics and American Society for Parenteral and Enteral Nutrition: characteristics recommended for the identification and documentation of adult malnutrition (undernutrition). *Journal of Parenteral and Enteral Nutrition*. 2012;36(3):275–83.

⁷ Lean M, Wiseman M. Malnutrition in hospitals. *BMJ*. 2008;336(7639):290.

⁸ White et al., 2012. Op. cit.

⁹ Tappenden KA, Quatrara B, Parkhurst ML, Malone AM, Fanjiang G, Ziegler TR. Critical role of nutrition in improving quality of care: an interdisciplinary call to action to address adult hospital malnutrition. *Journal of the Academy of Nutrition and Dietetics*. 2013;113(9):1219–37.

¹⁰ White et al., 2012. Op. cit.

¹¹ Ibid.

Healthcare Cost and Utilization Project (HCUP) Statistical Briefs^{12,13}. The report presents national estimates on the characteristics of inpatient stays in the United States involving malnutrition in 2016. Malnutrition is identified using a broad set of diagnostic codes that included the following six categories:

- Postsurgical nonabsorption
- Nutritional neglect
- Cachexia
- Protein-calorie malnutrition
- Weight loss or failure to thrive
- Underweight.

Statistics are presented on the frequency of occurrence for these six types of malnutrition, as well as for patient characteristics, admission and discharge characteristics, and outcomes for malnutrition-related stays, including costs, in-hospital mortality, and average length of stay (LOS). Additionally, the most common principal diagnoses are presented for the different types of malnutrition-related stays. Each section presents information first for all malnutrition-related inpatient stays and then for all-cause 30-day rates of readmissions following an initial inpatient hospital stay (i.e., the index stay) for patients with malnutrition in 2016.

This report uses the HCUP National Inpatient Sample (NIS) to report on non-maternal and non-neonatal inpatient stays related to malnutrition and uses the HCUP Nationwide Readmission Database (NRD) to examine readmission rates for these patients. Supplemental data sources included population denominator data derived from demographic data provided by Claritas¹⁴, a vendor that compiles and adds value to the U.S. Bureau of Census data. Claritas uses intra-census methods to estimate household and demographic statistics by ZIP Code.

HCUP includes the largest collection of longitudinal hospital care data in the United States, with all-payer, encounter-level information beginning in 1988. The HCUP NIS is the largest all-payer inpatient care database in the United States, containing data on more than seven million inpatient stays. The HCUP NRD is a unique and powerful database designed to support various types of analyses of national readmission rates for all payers and the uninsured. The list of Partner organizations that contribute to the HCUP NIS and NRD is available in Appendix I.

For this report, non-maternal and non-neonatal inpatient stays related to malnutrition were identified by *International Classification of Diseases, Tenth Revision, Clinical Modification* (ICD-10-CM) diagnosis codes. The United States transitioned to the ICD-10-CM scheme for diagnostic coding on billing records on October 1, 2015. A full list of the ICD-10-CM diagnosis codes used as well as additional information on the methods are detailed in Appendix II.

¹²Weiss et al., 2016. Op cit.

¹³Fingar KR, Weiss AJ, Barrett ML, Elixhauser A, Steiner CA, Guenter P, et al. All-Cause Readmissions Following Hospital Stays for Patients With Malnutrition, 2013. HCUP Statistical Brief #218. December 2016. Agency for Healthcare Research and Quality, Rockville, MD. <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb218-Malnutrition-Readmissions-2013.pdf>. Accessed August 15, 2018.

¹⁴Claritas. Claritas Demographic Profile by ZIP Code. <https://claritas360.claritas.com/mybestsegments/>.

RESULTS

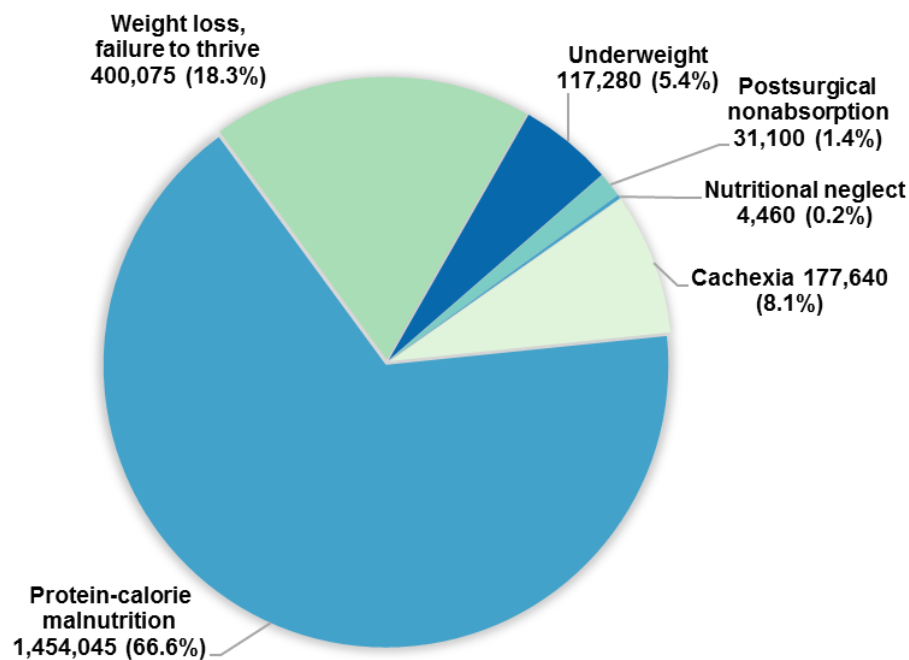
Overall

All Malnutrition-Related Inpatient Stays

In 2016, there were 2.2 million non-maternal and non-neonatal inpatient stays related to malnutrition, representing 8 percent of the 27.6 million total non-maternal and non-neonatal stays (data not shown). The most common type of malnutrition was protein-calorie malnutrition with approximately 1.45 million malnutrition-related stays (66.6 percent).

Weight loss or failure to thrive was the next most common type of malnutrition, at 18.3 percent of all malnutrition-related inpatient stays (Figure 1). The remaining four malnutrition types combined constituted about 15 percent of all malnutrition-related inpatient stays: cachexia (8.1 percent), underweight (5.4 percent), postsurgical non-absorption (1.4 percent), and nutritional neglect (less than 1 percent).

Figure 1. Types of malnutrition among non-maternal and non-neonatal inpatient stays, 2016

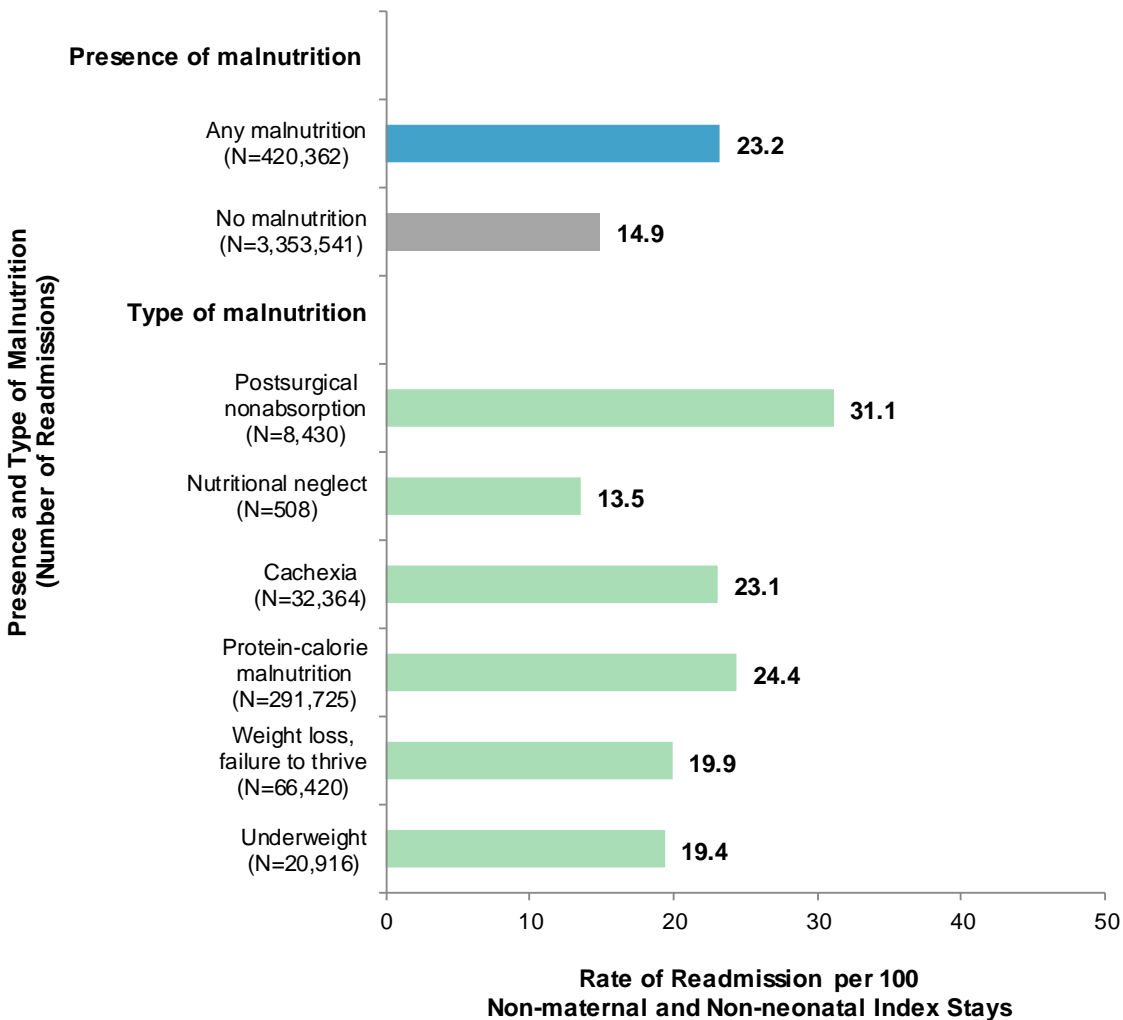


Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets (CDOM), Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2016

Readmissions for Malnutrition-Related Inpatient Stays

The 30-day readmission rate for any cause following an initial hospital stay for non-maternal and non-neonatal patients with malnutrition was 23.2 per 100 index stays, more than 50 percent higher than the rate among patients with no malnutrition during the index stay (14.9). Further detail is provided in Figure 2.

Figure 2. All-cause 30-day readmissions following an initial hospital stay for non-maternal and non-neonatal patients with malnutrition, 2016



Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Readmissions Database (NRD), 2016

Patient Characteristics

All Malnutrition-Related Inpatient Stays

Table 1 shows that the mean patient age among non-maternal and non-neonatal inpatient stays related to malnutrition was highest for cachexia (68.4 years), protein-calorie malnutrition (66.0 years), and underweight (64.8 years). Mean patient age was approximately 20 years younger for malnutrition-related inpatient stays involving postsurgical non-absorption (46.0 years) and nutritional neglect (43.7 years).

Across all six types of malnutrition-related inpatient stays, the rate of hospitalization was generally highest in low-income communities and decreased progressively with increases in median community income level. Focusing on the most common type of malnutrition (protein-calorie malnutrition), there were 559 inpatient stays per 100,000 population in the lowest-median income communities (quartile 1) compared with 338 stays per 100,000 in the highest-median income communities (quartile 4).

Table 1. Characteristics by malnutrition type among non-maternal and non-neonatal inpatient stays related to malnutrition, 2016

Characteristic	Postsurgical non-absorption	Nutritional neglect	Cachexia	Protein-calorie malnutrition	Weight loss, failure to thrive	Underweight
Total number	31,100	4,460	177,640	1,454,045	400,075	117,280
Rate per 100,000 population	9.6	1.4	55.1	451.0	124.1	36.4
Age, mean	46.0	43.7	68.4	66.0	58.6	64.8
Age, rate per 100,000 population						
< 18	8.5	2.6	1.6	41.4	91.9	3.0
18–39	4.2	0.1	9.7	106.8	22.4	15.5
40–64	11.8	0.5	54.2	436.8	82.0	30.8
65–84	17.8	3.1	180.2	1,487.1	354.1	105.6
85+	12.6	9.5	547.1	3,753.7	1,186.8	374.0
Sex, rate per 100,000 population						
Male	7.2	1.2	57.1	444.1	124.9	27.9
Female	12.0	1.6	53.0	456.9	123.0	44.5
Race/ethnicity, rate per 100,000 population						
White	10.4	1.1	57.1	486.7	129.3	41.4
Black	10.7	2.8	84.5	556.7	155.8	45.4
Hispanic	4.8	0.8	23.9	207.9	63.7	11.5
Other	4.4	1.1	40.5	316.9	86.4	24.3

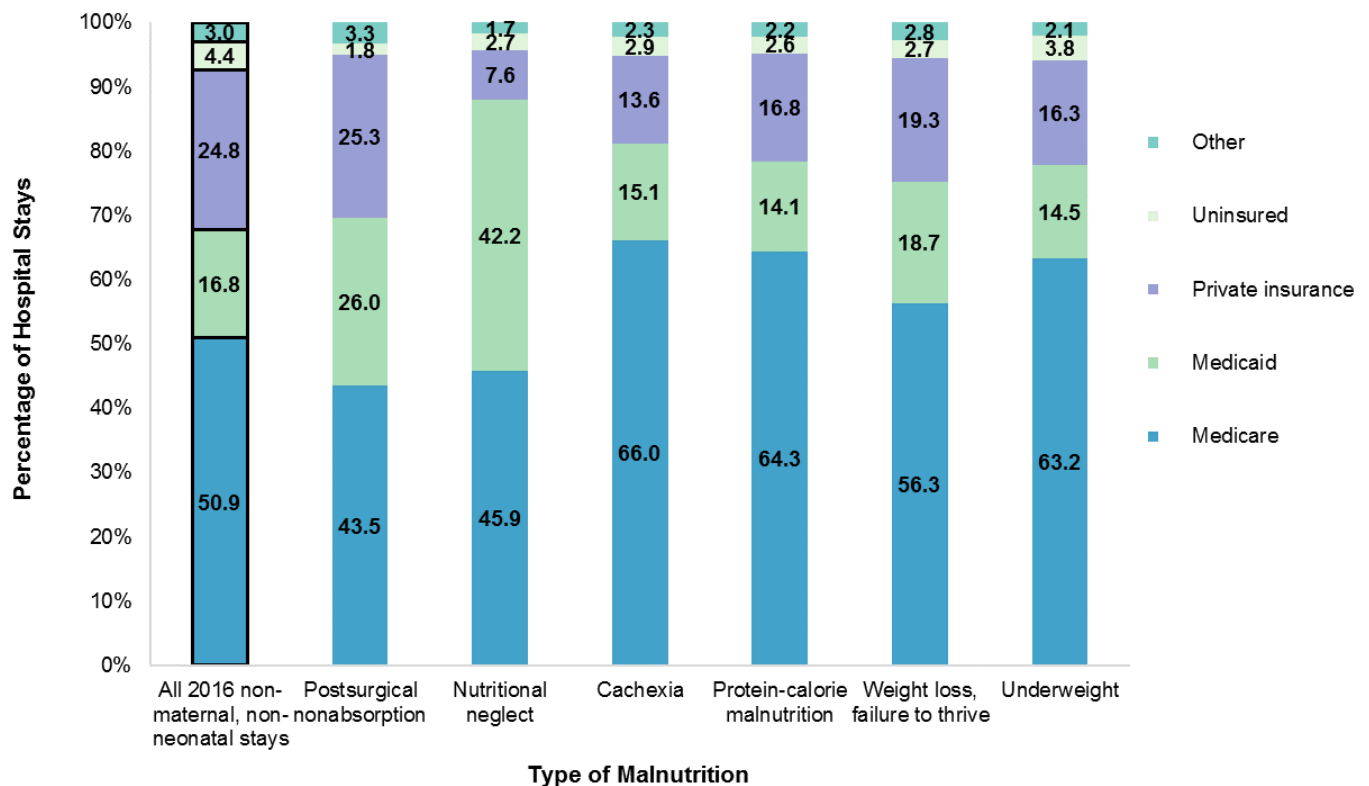
Characteristic	Postsurgical non-absorption	Nutritional neglect	Cachexia	Protein-calorie malnutrition	Weight loss, failure to thrive	Underweight
Community-level income, rate per 100,000 population						
Quartile 1 (lowest)	10.4	2.3	72.6	559.5	150.1	47.5
Quartile 2	10.7	1.4	55.4	464.7	128.5	37.7
Quartile 3	9.2	1.2	47.2	405.6	111.5	31.5
Quartile 4 (highest)	7.6	0.5	39.1	338.0	97.3	26.0
Location of residence, rate per 100,000 population						
Large central Metropolitan	8.7	1.5	55.2	462.5	121.2	33.1
Large fringe Metropolitan	9.5	1.0	49.4	403.1	120.5	33.1
Medium/small Metropolitan	10.1	1.5	55.2	444.3	121.8	38.2
Micropolitan/noncore	10.9	1.7	60.2	505.0	137.0	44.2

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets (CDOM), Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2016

Figure 3 shows the expected payer distribution by type of malnutrition among non-maternal and non-neonatal stays related to malnutrition. For reference, the expected payer distribution of all 2016 non-maternal, non-neonatal stays is also provided.

Compared with all non-maternal, non-neonatal inpatient stays in 2016, a higher proportion of stays involving postsurgical non-absorption and nutritional neglect had an expected primary payer of Medicaid (26.0 and 42.2 percent, respectively, vs. 16.8 percent for all stays). Among the other four types of malnutrition-related inpatient stays, between 56.3 and 66.0 percent of stays had an expected primary payer of Medicare compared with only half of all non-maternal, non-neonatal stays (50.9 percent).

Figure 3. Distribution of expected payer by malnutrition type among non-maternal and non-neonatal inpatient stays related to malnutrition, 2016



Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets (CDOM), Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2016

Readmissions for Malnutrition-Related Inpatient Stays

Whereas the readmission rate among index stays without malnutrition increased with age (Figure 4), the readmission rate among non-maternal and non-neonatal index stays for patients with any type of malnutrition was highest among adults aged 40–64 (26.3 per 100 index stays) and 18–39 years (25.8) and lowest among older adults aged 85+ years (17.1).

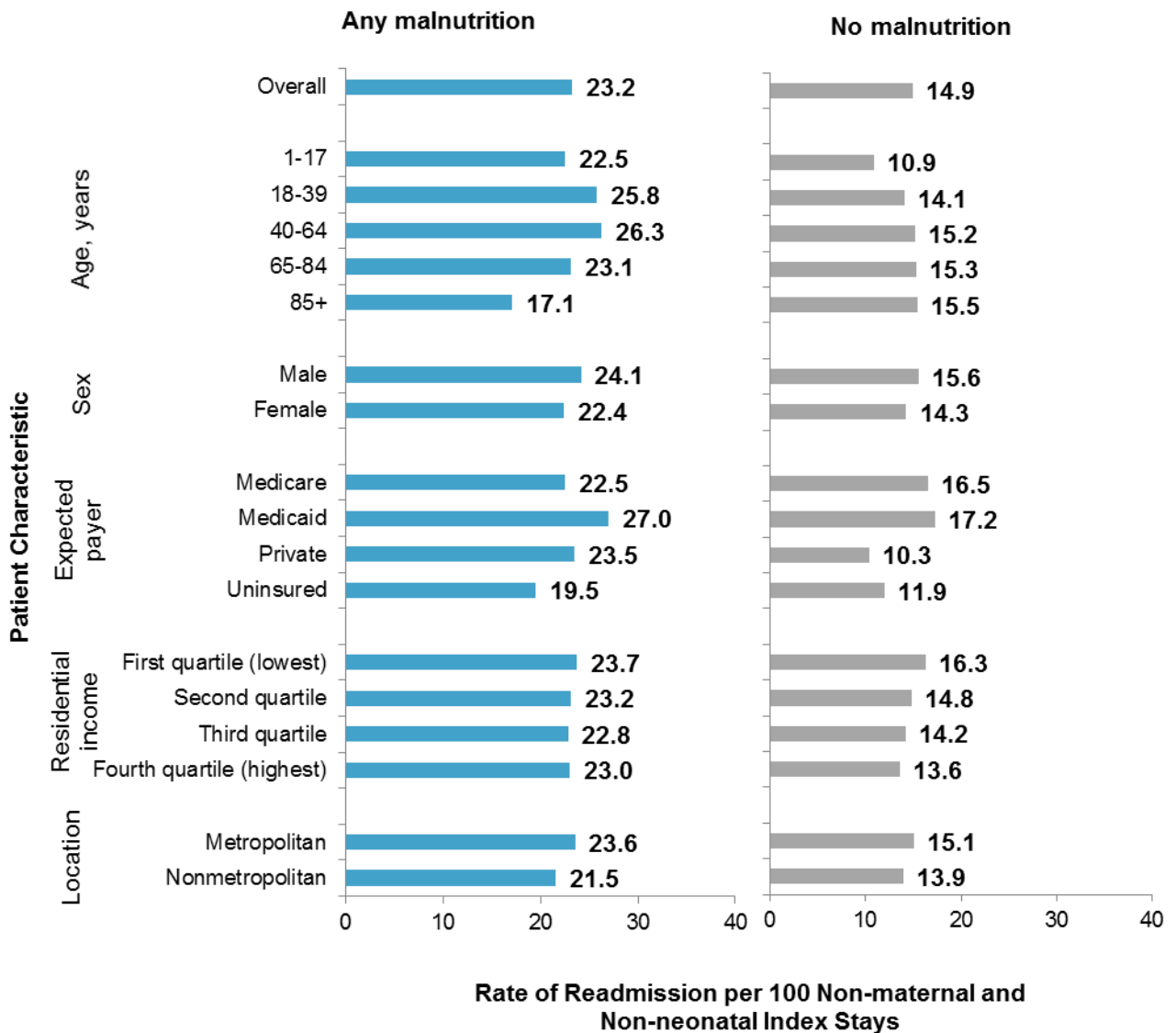
Among malnutrition-related index stays with an expected payer of Medicare, over a quarter of stays were followed by a 30-day readmission for any cause (27.0 per index stays). In comparison, the rate was 23.5 for stays with an expected payer of private insurance, 22.5 for stays with Medicare, and 19.5 for uninsured index stays with malnutrition.

In each payer category, the readmission rate was higher for malnutrition-related index stays than for those without malnutrition, particularly among stays for patients with private insurance (23.0 per 100 index stays involving malnutrition vs. 10.3 per 100 index stays without malnutrition).

Compared to index stays without malnutrition, the readmission rate among malnutrition-related index stays was similar across all four median community income levels (approximately 23–24 readmissions per 100 index stays). In each income quartile, the readmission rate was higher with malnutrition-related index stays than for those without malnutrition.

Further detail on the characteristics of readmissions involving malnutrition in 2016 is provided in Figure 4 and Table 2.

Figure 4. All-cause 30-day readmissions among non-maternal and non-neonatal inpatient stays related to malnutrition versus those without malnutrition, by patient characteristics, 2016



Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Readmissions Database (NRD), 2016

Table 2. All-cause 30-day readmissions r by presence and type of malnutrition, and patient characteristics, 2016

Patient characteristic	Any malnutrition	No malnutrition	Type of malnutrition					
			Postsurgical non-absorption	Nutritional neglect	Cachexia	Protein-calorie malnutrition	Weight loss, failure to thrive	Underweight
Total readmitted, N	420,362	3,353,541	8,430	508	32,364	291,725	66,420	20,916
Total, rate	23.2	14.9	31.1	13.5	23.1	24.4	19.9	19.4
Age group, years, rate								
1–17	22.5	10.9	29.7	10.4	32.9	27.4	19.2	19.4
18–39	25.8	14.1	37.7	10.2	30.0	27.5	19.0	19.9
40–64	26.3	15.2	32.2	17.8	26.5	27.4	22.2	21.3
65–84	23.1	15.3	27.2	15.2	22.4	24.0	21.0	19.7
85+	17.1	15.5	23.6	13.3	16.2	17.9	15.6	15.5
Sex, rate								
Male	24.1	15.6	31.3	14.1	24.4	25.2	20.8	21.2
Female	22.4	14.3	30.9	13.1	21.6	23.6	19.0	18.2
Expected payer, rate								
Medicare	22.5	16.5	30.0	14.6	21.7	23.5	19.8	19.5
Medicaid	27.0	17.2	35.3	12.3	28.6	28.6	21.9	22.5
Private insurance	23.5	10.3	27.7	11.6	24.5	25.1	19.1	16.9
Uninsured	19.5	11.9	26.8	*	22.4	20.8	16.0	15.2
Community-level income, rate								
First quartile (poorest)	23.7	16.3	31.1	13.1	24.2	24.8	20.5	20.0
Second quartile	23.2	14.8	29.5	16.4	22.4	24.4	19.9	19.2
Third quartile	22.8	14.2	32.2	11.9	22.7	23.9	19.2	19.3
Fourth quartile (wealthiest)	23.0	13.6	31.5	12.3	22.3	24.2	19.8	18.5
Location of residence, rate								
Metropolitan	23.6	15.1	31.8	13.7	23.6	24.7	20.1	19.7
Nonmetropolitan	21.5	13.9	27.6	12.9	20.3	22.7	18.6	17.7

Note: Rate is per 100 non-maternal and non-neonatal index stays.

* Suppressed due to cell size <11 readmissions.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Readmissions Database (NRD), 2016

Outcomes Related to Malnutrition

All Malnutrition-Related Inpatient Stays

In 2016, the aggregate cost of all non-maternal and non-neonatal inpatient stays was \$389.1 billion (data not shown). Non-maternal and non-neonatal inpatient stays related to malnutrition accounted for nearly \$49 billion (Table 3), or 12.6 percent of these aggregate hospital costs. In contrast, as described earlier, malnutrition-related inpatient stays constituted only 8.1 percent of all non-maternal and non-neonatal inpatient stays in 2016.

Table 3. Admission and discharge characteristics and outcomes by malnutrition type for non-maternal and non-neonatal inpatient stays related to malnutrition, 2016

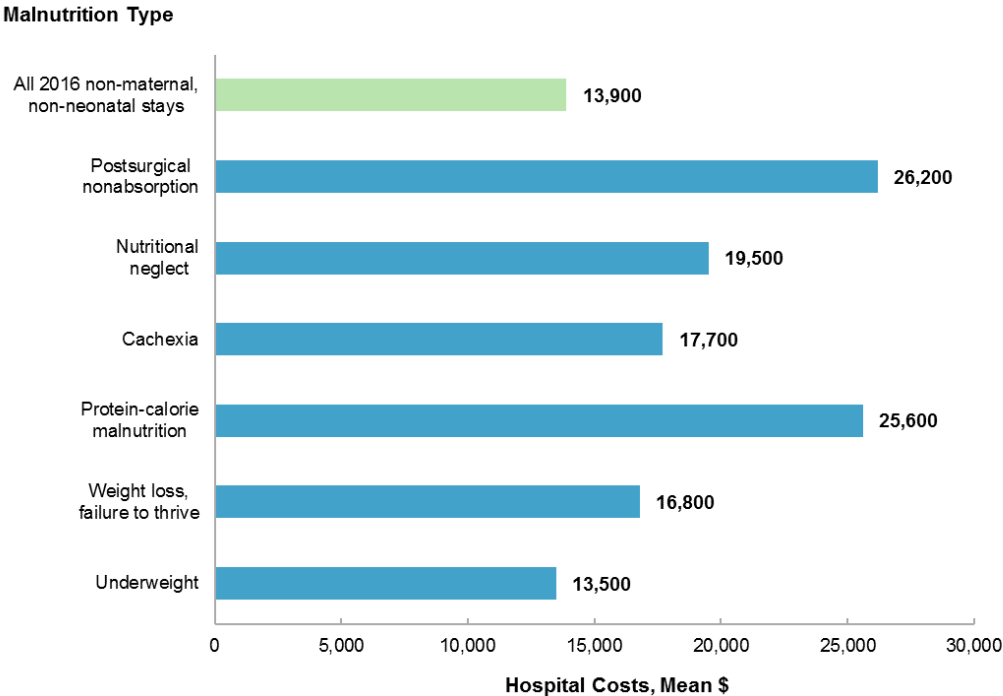
Characteristic or outcome	Postsurgical non-absorption	Nutritional neglect	Cachexia	Protein-calorie malnutrition	Weight loss, failure to thrive	Underweight
Total number	31,100	4,460	177,640	1,454,045	400,075	117,280
Admissions						
Malnutrition present on admission, %	93.4	87.8	96.0	91.9	94.3	*
Malnutrition as secondary diagnosis only, %	93.4	81.4	99.9	99.3	96.8	100.0
Elective admission, %	12.5	7.0	6.7	10.4	11.5	11.4
ED services, %	66.0	70.9	79.1	70.6	69.1	73.6
Discharge status, %						
Routine Discharge	52.9	44.6	29.7	31.1	46.5	48.4
Transfer to another acute care hospital	2.9	3.4	2.4	2.8	2.5	2.3
Transfer to another facility	13.4	36.7	32.4	36.0	28.0	26.0
Home health Care	27.6	12.2	22.7	21.3	17.2	18.1
Against medical advice	0.8	0.3	1.5	1.0	0.9	1.4
Died during hospital stay	2.2	2.6	11.2	7.6	4.8	3.6
Outcomes						
Length of stay, mean days	9.8	11.2	7.5	10.1	6.9	6.2
Hospital costs, mean \$	26,146	19,426	17,614	25,535	16,707	13,485
Aggregate hospital costs, mean, millions \$	813,130,482	86,642,135	3,128,867,307	37,129,434,545	6,684,082,320	1,581,548,865

* Because two frequent codes in the underweight malnutrition type (Z681 and Z6851) are exempt from present-on-admission reporting, this information is not reported.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets (CDOM), Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2016

Malnutrition-related inpatient stays for all six types of malnutrition except underweight cost more than all non-maternal, non-neonatal inpatient stays in 2016 (\$13,900), ranging from 17 percent times more costly for weight loss or failure to thrive diagnoses to twice as costly for protein-calorie malnutrition (Figure 5).

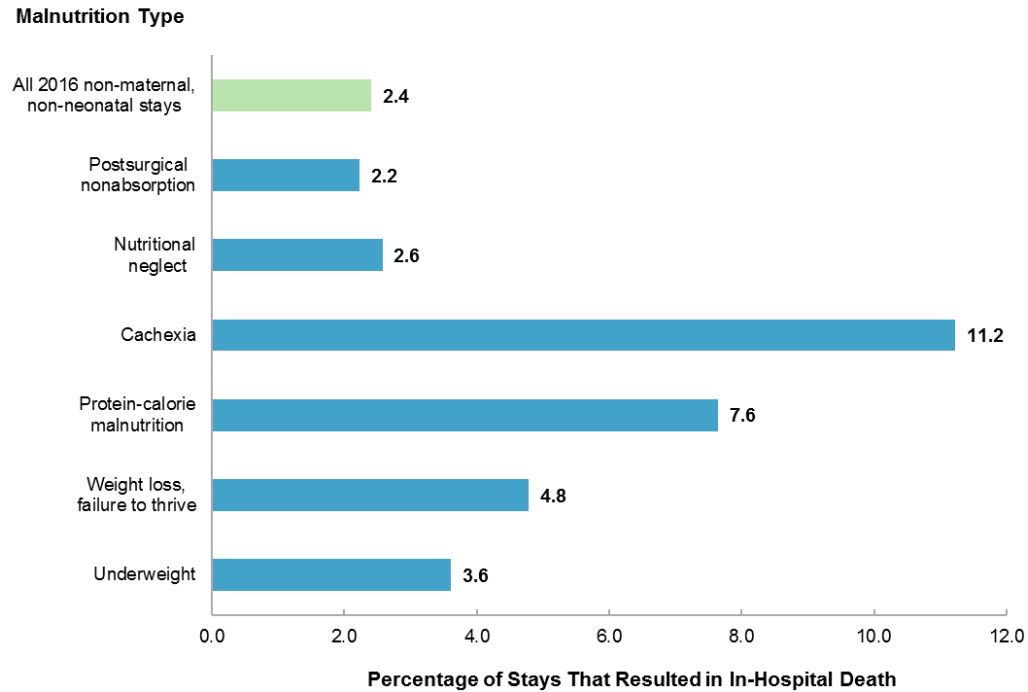
Figure 5. Average hospital costs by malnutrition type, 2016



Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets (CDOM), Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2016

Malnutrition-related inpatient stays for all six types of malnutrition except postsurgical non-absorption had a substantially higher proportion of in-hospital deaths (Figure 6) compared with all non-maternal, non-neonatal inpatient stays in 2016 (2.4 percent). For malnutrition-related stays, the in-hospital deaths ranged from 3.6 percent for underweight diagnoses to 11.2 percent for cachexia.

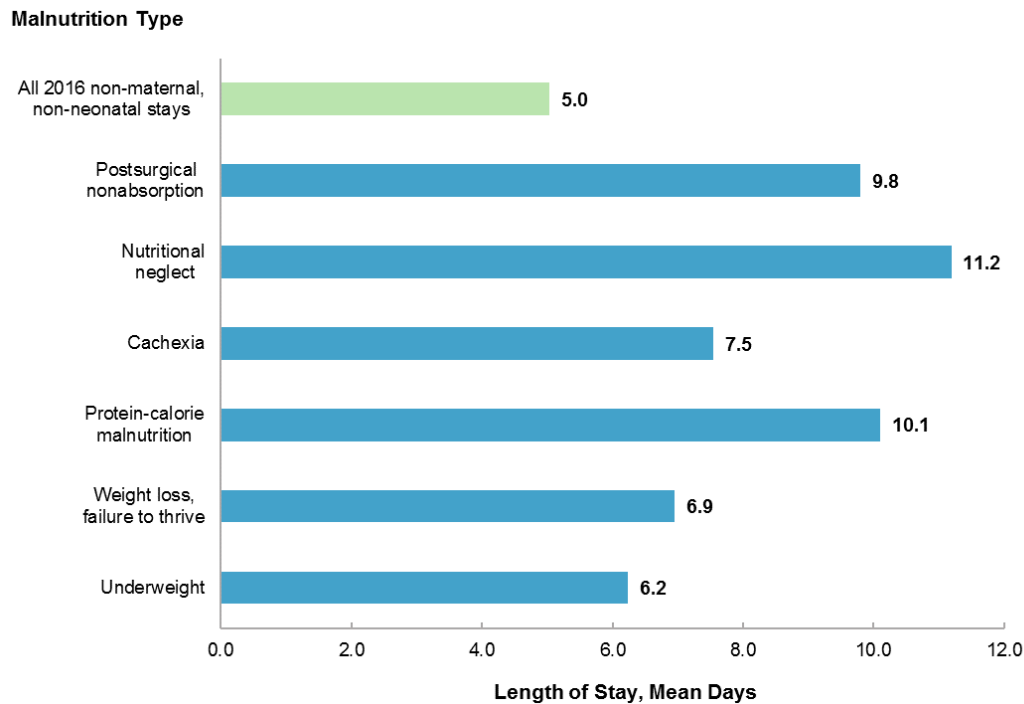
Figure 6. Percentage of non-maternal and non-neonatal stays that resulted in in-hospital death by malnutrition type, 2016



Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets (CDOM), Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2016

Compared with the average length of all non-maternal, non-neonatal inpatient stays (5.0 days), malnutrition-related inpatient stays for all six types of malnutrition (Figure 7) were longer on average, ranging from 1.2 days longer for underweight diagnoses (6.2 days) to more than twice as long for protein-calorie malnutrition (11.2 days).

Figure 7. Average length of by malnutrition type among non-maternal and non-neonatal inpatient stays related to malnutrition, 2016



Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets (CDOM), Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2016

Readmissions for Malnutrition-Related Inpatient Stays

Among non-maternal and non-neonatal index stays for patients with malnutrition, the average cost of readmission was \$17,500 (Table 4), 21 percent lower than the cost of the index stay (\$22,200). The reverse pattern was seen for index stays without malnutrition: the average cost per readmission was \$14,300, 11 percent higher than the cost of the index stay (\$12,900).

The average cost of both index stays and readmissions was highest among stays with protein-calorie malnutrition and postsurgical non-absorption, compared with other types of malnutrition or no malnutrition. Further detail is provided in Table 4.

Table 4. Average cost by presence and type of malnutrition among non-maternal and non-neonatal index stays for patients with malnutrition, 2016

Type of malnutrition at index stay	Average cost of index admission, \$	Average cost of readmission, \$	Marginal difference in cost of readmission, \$	Change in cost of readmission, %
Presence of malnutrition				
Any malnutrition	22,200	17,500	-4,700	-21.2
No malnutrition	12,900	14,300	1,400	10.9
Type of malnutrition				
Postsurgical non-absorption	23,200	19,400	-3,800	-16.4
Nutritional neglect	18,700	16,800	-1,900	-10.2
Cachexia	17,600	16,300	-1,300	-7.4
Protein-calorie malnutrition	25,600	18,000	-7,600	-29.7
Weight loss, failure to thrive	15,300	16,800	1,500	9.8
Underweight	13,500	14,400	900	6.7

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets (CDOM), Healthcare Cost and Utilization Project (HCUP), Nationwide Readmissions Database (NRD), 2016

Most Common Principal Diagnoses

All Malnutrition-Related Inpatient Stays

Looking at the broader classification of conditions in Table 5, roughly one-third of non-maternal and non-neonatal inpatient stays related to malnutrition involving postsurgical non-absorption and nutritional neglect had an injury and poisoning principal diagnosis grouping, a broad category of conditions that includes trauma, burns, hip fractures, and complications of care. Respiratory system disease was the most common principal diagnosis grouping among inpatient stays involving cachexia (17.5 percent) and underweight diagnoses (15.1 percent).

Table 5. Top five principal diagnosis groupings by malnutrition type among non-maternal and non-neonatal inpatient stays related to malnutrition, 2016

Principal diagnosis grouping ^a	Postsurgical non-absorption		Nutritional neglect		Cachexia		Protein-calorie malnutrition		Weight loss, failure to thrive		Underweight	
	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%
Injury and poisoning ^b	1	30.5	1	34.1	--	--	5	10.2	--	--	4	10.2
Digestive system	2	20.1	--	--	5	9.9	2	14.1	1	12.9	2	13.7
Infectious and parasitic	3	9.9	4	8.3	2	17.0	1	18.9	--	--	5	9.4
Genitourinary system	4	8.2	5	7.0	--	--	--	--	--	--	--	--
Endocrine/nutritional/metabolic	5	6.8	2	12.2	--	--	--	--	4	11.0	--	--
Mental illness	--	--	3	10.5	--	--	--	--	--	--	--	--
Respiratory system	--	--	--	--	1	17.5	4	11.0	2	12.9	1	15.1
Circulatory system	--	--	--	--	3	13.2	3	11.7	3	11.6	3	13.4
Neoplasms	--	--	--	--	4	11.2	--	--	5	9.4	--	--

Notes: A dash indicates that the condition did not rank among the top five principal diagnosis groupings for that type of malnutrition. Denominators for all percentage calculations are the total number of non-maternal and non-neonatal inpatient stays for each malnutrition type.

^a Principal diagnosis grouping was identified based on the Multi-level 1 Category for Clinical Classifications Software, beta version 2018.1 for International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM).

^b Includes complications of surgical procedures or medical care, and complication of device, implant or graft.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets (CDOM), Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2016

Septicemia—a potentially overwhelming infection of the bloodstream—was the most common principal diagnosis among malnutrition-related inpatient stays categorized as protein-calorie malnutrition (17.8 percent of stays), cachexia (15.0 percent), underweight (8.5 percent), weight loss or failure to thrive (7.7 percent), and nutritional neglect (7.5 percent). Further detail is provided in Table 6.

Table 6. Top five principal diagnoses by malnutrition type among non-maternal and non-neonatal inpatient stays related to malnutrition, 2016

Principal diagnosis CCS ^a	Postsurgical non-absorption		Nutritional neglect		Cachexia		Protein-calorie malnutrition		Weight loss, failure to thrive		Underweight	
	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%
Complications of surgical procedures or medical care	1	24.1	--	--	--	--	4	2.8	--	--	--	--
Septicemia (except in labor)	2	8.4	1	7.5	1	15.0	1	17.8	1	7.7	1	8.5
Acute and unspecified renal failure	3	6.1	--	--	--	--	2	3.5	3	4.5	5	2.8
Intestinal obstruction without hernia	4	5.6	--	--	--	--	--	--	--	--	--	--
Complication of device; implant or graft	5	4.6	5	2.9	--	--	5	2.6	--	--	--	--
Urinary tract infections	--	--	3	3.8	--	--	--	--	--	--	--	--
Other nutritional; endocrine; and metabolic disorders	--	--	2	3.8	--	--	--	--	2	4.6	--	--
Fluid and electrolyte disorders	--	--	4	3.4	--	--	--	--	5	3.5	--	--
Diabetes mellitus with complications	--	--	--	--	--	--	--	--	--	--	--	--
Chronic obstructive pulmonary disease and bronchiectasis	--	--	--	--	2	4.9	--	--	--	--	2	4.8
Pneumonia	--	--	--	--	3	4.7	3	3.4	4	3.8	3	4.5
Respiratory failure; insufficiency; arrest (adult)	--	--	--	--	4	4.0	--	--	--	--	--	--
Congestive heart failure; non-hypertensive	--	--	--	--	5	3.4	--	--	--	--	--	--
Fracture of hip	--	--	--	--	--	--	--	--	--	--	4	3.0

Abbreviation: CCS, Clinical Classifications Software

Notes: A dash indicates that the condition did not rank among the top five principal Clinical Classifications Software (CCS) diagnoses for that type of malnutrition. Denominators for all percentage calculations are the total number of inpatient stays for each malnutrition type.

^a Clinical Classification Software, beta version 2018.1 for International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM).

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2016

Readmissions for Malnutrition-Related Inpatient Stays

While infectious and parasitic diseases ranked in the top five leading principal diagnosis groupings at readmission among non-maternal and non-neonatal index stays for patients with malnutrition (Table 7), this was not the case for readmissions among index stays without malnutrition. For the latter group, mental illness ranked in the top five principal diagnosis groupings. The four-remaining leading principal diagnosis groupings at readmission—circulatory system, digestive system, respiratory system, and injury and poisoning—were similar for malnutrition-related index stays and those without malnutrition.

Table 7. Top five principal diagnosis groupings at the readmission, by presence and type of malnutrition at the index stay, 2016

Principal diagnosis grouping ^a at readmission	Any malnutrition		No malnutrition		Type of malnutrition											
					Postsurgical non-absorption		Nutritional neglect		Cachexia		Protein-calorie malnutrition		Weight loss, failure to thrive		Underweight	
	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%
Total readmitted, N	420,362		3,353,541		8,430		508		32,364		291,725		66,420		20,916	
Infectious and parasitic	1	15.9	--	--	3	11.0	1	17.7	1	17.4	1	17.1	4	12.1	4	11.4
Digestive system	2	14.1	2	11.3	2	20.3	--	--	4	11.6	2	14.5	2	12.7	3	13.1
Circulatory system	3	12.2	1	19.2	--	--	5	9.9	3	12.5	3	12.1	1	13.4	2	13.2
Respiratory system	4	11.8	4	10.6	--	--	4	9.9	2	16.2	4	11.4	5	11.5	1	14.7
Injury and poisoning	5	10.5	3	11.1	1	28.5	3	14.6	--	--	5	10.8	--	--	5	9.6
Mental Illness	--	--	5	10.0	--	--	2	15.6	--	--	--	--	--	--	--	--
Genito-urinary system	--	--	--	--	4	10.2	--	--	--	--	--	--	--	--	--	--
Endocrine, nutritional, and metabolic	--	--	--	--	5	6.6	--	--	--	--	--	--	--	--	--	--
Neoplasms	--	--	--	--	--	--	--	--	5	10.0	--	--	3	12.1	--	--

Notes: A dash indicates that the condition did not rank among the top five principal diagnosis groupings for that type of malnutrition.

Denominators for all percentage calculations are the total number of non-maternal and non-neonatal inpatient stays for each malnutrition type.

^a Principal diagnosis grouping was identified based on the Multi-level 1 Category for Clinical Classifications Software, beta version

2018.1 for International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM).

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Readmissions Database (NRD), 2016

Generally, septicemia was the most common principal diagnosis at readmission regardless of the presence of malnutrition during the index stay (Table 8). However, the proportion of readmissions for septicemia was more than twice as high among malnutrition-related index stays compared with those without malnutrition (14.8 vs. 7.7 percent of readmissions).

Septicemia was the most common principal diagnosis among readmissions for five of the six specific types of malnutrition—nutritional neglect (16.7 percent of readmissions), protein-calorie malnutrition (16.1 percent), cachexia (15.4 percent), weight loss or failure to thrive (11.0 percent), and underweight diagnoses (10.4 percent). However, for the sixth type of malnutrition—postsurgical non-absorption—complication of surgical procedures or medical care was the most common diagnosis at readmission (21.6 percent), while septicemia was the second common principal diagnosis at readmission (9.5 percent).

Table 8. Top five principal diagnoses at readmission, by presence and type of malnutrition at the index stay, 2016

Principal diagnosis CCS ^a at readmission	Any malnutrition		No malnutrition		Type of malnutrition											
					Postsurgical non- absorption		Nutritional neglect		Cachexia		Protein- calorie malnutrition		Weight loss, failure to thrive		Under- weight	
	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%
Total readmitted, N	420,362		3,353,541		8,430		508		32,364		291,725		66,420		20,916	
Septicemia (except in labor)	1	14.8	1	7.7	2	9.5	1	16.7	1	15.4	1	16.1	1	11.0	1	10.4
Complications of surgical procedures or medical care	2	4.6	3	4.6	1	21.6	--	--	--	--	2	4.8	4	3.4	--	--
Complication of device; implant or graft	3	3.4	5	3.4	5	5.3	3	3.8	--	--	3	3.6	--	--	--	--
CHF	4	3.3	2	5.0	--	--	--	--	5	3.8	4	3.3	2	3.5	5	3.3
Pneumonia	5	3.2	--	--	--	--	--	--	4	4.1	--	3.1	5	3.3	2	3.9
Acute and unspecified renal failure	--	--	--	--	3	7.6	--	--	--	--	5	3.1	3	3.4	--	--
Intestinal obstruction without hernia	--	--	--	--	4	5.7	--	--	--	--	--	--	--	--	--	--
Mood disorders	--	--	4	3.5	--	--	2	7.2	--	--	--	--	--	--	--	--
Diabetes mellitus with complications	--	--	--	--	--	--	4	3.6	--	--	--	--	--	--	--	--
Urinary tract infections	--	--	--	--	--	--	5	3.4	--	--	--	--	--	--	--	--
COPD	--	--	--	--	--	--	--	--	3	4.1	--	--	--	--	3	3.7
Respiratory failure	--	--	--	--	--	--	--	--	2	4.2	--	--	--	--	4	3.5

Abbreviations: CCS, Clinical Classifications Software; CHF, congestive heart failure; COPD, chronic obstructive pulmonary disease
Notes: A dash indicates that the condition did not rank among the top five primary condition groupings for that type of malnutrition.
Denominators for all percentage calculations are the total number of inpatient stays for each malnutrition type.

^a Clinical Classification Software, beta version 2018.1 for International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM).

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Readmissions Database (NRD), 2016

APPENDIX A: HCUP PARTNERS

HCUP Partners in the 2016 National Inpatient Sample

State	Data Organization
AK	Alaska Department of Health and Social Services
AR	Arkansas Department of Health
AZ	Arizona Department of Health Services
CA	California Office of Statewide Health Planning & Development
CO	Colorado Hospital Association
CT	Connecticut Hospital Association
DC	District of Columbia Hospital Association
FL	Florida Agency for Health Care Administration
GA	Georgia Hospital Association
HI	Hawaii Health Information Corporation
IA	Iowa Hospital Association
IL	Illinois Department of Public Health
IN	Indiana Hospital Association
KS	Kansas Hospital Association
KY	Kentucky Cabinet for Health and Family Services
LA	Louisiana Department of Health
MA	Massachusetts Center for Health Information and Analysis
MD	Maryland Health Services Cost Review Commission
ME	Maine Health Data Organization
MI	Michigan Health & Hospital Association
MN	Minnesota Hospital Association
MO	Missouri Hospital Industry Data Institute
MS	Mississippi Department of Health

State	Data Organization
MT	Montana Hospital Association
NC	North Carolina Department of Health and Human Services
ND	North Dakota (data provided by the Minnesota Hospital Association)
NE	Nebraska Hospital Association
NJ	New Jersey Department of Health
NM	New Mexico Department of Health
NV	Nevada Department of Health & Human Services
NY	New York State Department of Health
OH	Ohio Hospital Association
OK	Oklahoma State Department of Health
OR	Oregon Association of Hospitals and Health Systems
PA	Pennsylvania Health Care Cost Containment Council
RI	Rhode Island Department of Health
SC	South Carolina Revenue and Fiscal Affairs Office
SD	South Dakota Association of Healthcare Organizations
TN	Tennessee Hospital Association
TX	Texas Department of State Health Services
UT	Utah Department of Health
VT	Vermont Association of Hospitals and Health Systems
VA	Virginia Health Information
WA	Washington State Department of Health
WI	Wisconsin Department of Health Services
WV	West Virginia Health Care Authority
WY	Wyoming Hospital Association

HCUP Partners in the 2016 Nationwide Readmissions Database

State	HCUP Data Source
Alaska	Alaska Department of Health and Social Services
Arkansas	Arkansas Department of Health
California	California Office of Statewide Health Planning and Development
Florida	Florida Agency for Health Care Administration
Georgia	Georgia Hospital Association
Hawaii	Hawaii Health Information Corporation
Iowa	Iowa Hospital Association
Louisiana	Louisiana Department of Health
Maryland	Maryland Health Services Cost Review Commission
Massachusetts	Massachusetts Center for Health Information and Analysis
Mississippi	Mississippi Department of Health
Missouri	Missouri Hospital Industry Data Institute
Nebraska	Nebraska Hospital Association
Nevada	Nevada Department of Health and Human Services
New Mexico	New Mexico Department of Health
New York	New York State Department of Health
Oregon	Oregon Association of Hospitals and Health Systems
Pennsylvania	Pennsylvania Health Care Cost Containment Council
South Carolina	South Carolina Revenue and Fiscal Affairs Office
South Dakota	South Dakota Association of Healthcare Organizations
Tennessee	Tennessee Hospital Association
Utah	Utah Department of Health
Vermont	Vermont Association of Hospitals and Health Systems
Virginia	Virginia Health Information
Washington	Washington State Department of Health
Wisconsin	Wisconsin Department of Health Services
Wyoming	Wyoming Hospital Association

APPENDIX B: METHODS

This section describes the methods employed to calculate statistics for non-maternal and non-neonatal inpatient stays related to malnutrition using the 2016 HCUP NIS and NRD.

Definitions

Diagnoses, ICD-10-CM, Clinical Classifications Software (CCS), and Major Diagnostic Categories (MDCs)

The principal diagnosis is that condition established after study to be chiefly responsible for the patient's admission to the hospital.

ICD-10-CM is the International Classification of Diseases, Tenth Revision, Clinical Modification, which assigns numeric codes to diagnoses. There are over 70,000 ICD-10-CM diagnosis codes.

CCS categorizes ICD-10-CM diagnosis codes into a manageable number of clinically meaningful categories¹⁵. This clinical grouper makes it easier to quickly understand patterns of diagnoses. CCS categories identified as Other typically are not reported; these categories include miscellaneous, otherwise unclassifiable diagnoses that may be difficult to interpret as a group.

MDCs assign ICD-10-CM principal diagnosis codes to one of 25 general diagnosis categories

Non-maternal and non-neonatal inpatient stays related to malnutrition

Maternal and neonatal discharges, identified by Major Diagnostic Category (MDC) 14 (Pregnancy, Childbirth & the Puerperium) and MDC 15 (Newborns and Other Neonates with Conditions Originating in the Perinatal Period), were excluded from the analysis.

The six types of malnutrition were defined using the ICD-10-CM diagnosis codes listed in Table B.1. Each non-maternal and non-neonatal inpatient stay involving malnutrition was categorized into only one malnutrition type based on the following hierarchy:

1. Postsurgical non-absorption or nutritional neglect
2. Cachexia or protein-calorie malnutrition
3. Weight loss/failure to thrive or underweight

If a single inpatient record included multiple diagnosis codes indicating different types of malnutrition (e.g., nutritional neglect and underweight), the record was classified into the higher-ranked type of malnutrition (in this example, nutritional neglect). If both types of malnutrition at the same hierarchy level appeared on a discharge record (e.g., both postsurgical non-absorption and nutritional neglect), then the record was classified into the malnutrition type that appeared first on the record.

¹⁵ Agency for Healthcare Research and Quality. HCUP Clinical Classifications Software (CCS). Healthcare Cost and Utilization Project (HCUP). Rockville, MD: Agency for Healthcare Research and Quality. Updated October 2017. <https://www.hcup-us.ahrq.gov/toolssoftware/ccs10/ccs10.jsp>.

Table B.1. ICD-10-CM diagnosis codes used to identify the six types of malnutrition

Any mention of postsurgical non-absorption
K912: Postsurgical malabsorption, not elsewhere classified
Any mention of nutritional neglect
T7401XA: Adult neglect or abandonment, confirmed, initial encounter
T7401XD: Adult neglect or abandonment, confirmed, subsequent encounter
T7401XS: Adult neglect or abandonment, confirmed, sequela
T7402XA: Child neglect or abandonment, confirmed, initial encounter
T7402XD: Child neglect or abandonment, confirmed, subsequent encounter
T7402XS: Child neglect or abandonment, confirmed, sequela
T7601XA: Adult neglect or abandonment, suspected, initial encounter
T7601XD: Adult neglect or abandonment, suspected, subsequent encounter
T7601XS: Adult neglect or abandonment, suspected, sequela
T7602XA: Child neglect or abandonment, suspected, initial encounter
T7602XD: Child neglect or abandonment, suspected, subsequent encounter
T7602XS: Child neglect or abandonment, suspected, sequela
Any mention of cachexia
R64: Cachexia
Any mention of malnutrition
E40: Kwashiorkor
E41: Nutritional marasmus
E43: Unspecified severe protein-calorie malnutrition
E440: Moderate protein-calorie malnutrition
E441: Mild protein-calorie malnutrition
E45: Retarded development following protein-calorie malnutrition
E46: Unspecified protein-calorie malnutrition
Any mention of weight loss
R6251: Failure to thrive (child)
R627: Adult failure to thrive
R633: Feeding difficulties
R634: Abnormal weight loss
Any mention of underweight
R636: Underweight
Z681: Body mass index (BMI) 19 or less, adult
Z6851: Body mass index (BMI) pediatric, less than 5th percentile for age

Unit of analysis

For malnutrition-related inpatient stays, the unit of analysis is the hospital discharge (i.e., the hospital stay), not a person or patient. This means that a person who is admitted to the hospital multiple times in 1 year will be counted each time as a separate discharge from the hospital.

For information related to readmissions, the unit of analysis is the index stay, not a person or patient. Every non-maternal and non-neonatal inpatient stay with a diagnosis of malnutrition is considered as a separate index stay. Thus, a single patient can be counted multiple times during the course of the January through November observation period. In addition, index stays do not require a prior “clean period” with no hospitalizations; that is, an inpatient stay may be a readmission for a prior index stay and also the index stay for a subsequent readmission. Inpatient stays were disqualified from the analysis as index stays if they could not be followed for 30 days for one of the following reasons: (1) the patient died in the hospital, (2) information on length of stay was missing, or (3) the patient was discharged in December.

Readmissions

Readmissions could be for any cause; thus, malnutrition may or may not have been recorded at the time of readmission. Thirty-day readmission rates are presented for the six types of malnutrition and across patient characteristics. The 30-day readmission rate is defined as the number of index stays for each condition for which there was at least one subsequent hospital admission within 30 days, divided by the total number of index stays from January through November of the same year. That is, when patients are discharged from the hospital, they are followed for 30 days in the data. If any readmission to the same or different hospital occurs during this time period, the admission is counted as having a readmission. No more than one readmission is counted within the 30-day period, because the outcome measure assessed is “percentage of admissions that are readmitted.” If a patient was transferred to a different hospital on the same day or was transferred within the same hospital, the two events were considered a single stay and the second event was not counted as a readmission; that is, transfers were not counted as a readmission. In the case of admissions for which there was more than one readmission in the 30-day period, the data presented in this report reflect the characteristics and costs of the first readmission.

Admission source and discharge status

Admission source (also known as the patient's point of origin) indicates where the patient was located prior to admission to the hospital. Emergency admission indicates that the patient was admitted to the hospital through the emergency department. Admission from another hospital indicates that the patient was admitted to this hospital from another short-term, acute-care hospital. This usually signifies that the patient required the transfer in order to obtain more specialized services that the originating hospital could not provide. Admission from a long-term care facility indicates that the patient was admitted from a long-term facility such as a nursing home.

Discharge status reflects the disposition of the patient at discharge from the hospital and includes the following six categories: routine (to home); transfer to another short-term hospital; other transfers (including skilled nursing facility, intermediate care, and another type of facility such as a nursing home); home health care; against medical advice (AMA); or died in the hospital.

Hospital costs

Total hospital charges were converted to costs using HCUP Cost-to-Charge Ratios based on hospital accounting reports from the Centers for Medicare & Medicaid Services (CMS).¹⁶ *Costs* reflect the actual expenses incurred in the production of hospital services, such as wages, supplies, and utility costs; *charges*

¹⁶ Agency for Healthcare Research and Quality. HCUP Cost-to-Charge Ratio (CCR) Files. Healthcare Cost and Utilization Project (HCUP). 2001–2016. Rockville, MD: Agency for Healthcare Research and Quality. Updated August 2018. <http://www.hcup-us.ahrq.gov/db/state/costtocharge.jsp>. Accessed August 16, 2018.

represent the amount a hospital billed for the case. For each hospital, a hospital-wide cost-to-charge ratio is used. Hospital charges reflect the amount the hospital billed for the entire inpatient stay and do not include professional (physician) fees. For the purposes of this report, mean costs are reported to the nearest hundred.

Expected payer

Payer is the expected payer for the hospital stay. To make coding uniform across all HCUP data sources, payer combines detailed categories into general groups:

- Medicare: includes patients covered by fee-for-service and managed care Medicare
- Medicaid: includes patients covered by fee-for-service and managed care Medicaid
- Private Insurance: includes Blue Cross, commercial carriers, and private health maintenance organizations (HMOs) and preferred provider organizations (PPOs)
- Uninsured: includes an insurance status of *self-pay* and *no charge*
- Other: includes Workers' Compensation, TRICARE/CHAMPUS, CHAMPVA, Title V, and other government programs.

For this report, when more than one payer is listed for a hospital discharge, the first-listed payer is used.

Location of patient's residence

Place of residence is based on the urban-rural classification scheme for U.S. counties developed by the National Center for Health Statistics (NCHS):

- Large Central Metropolitan: Central counties of metropolitan areas with 1 million or more residents
- Large Fringe Metropolitan: Fringe counties of counties of metropolitan areas with 1 million or more residents
- Medium Metropolitan: Counties in metropolitan areas of 250,000-999,999 residents
- Small Metropolitan: Counties in metropolitan areas of 50,000-249,999 residents
- Micropolitan: Nonmetropolitan counties areas of 10,000 or more residents
- Noncore: Nonmetropolitan and nonmicropolitan counties

Median community-level income

Median community-level income is the median household income of the patient's ZIP Code of residence. Income levels are separated into population-based quartiles with cut-offs determined using ZIP Code demographic data obtained from Claritas.¹⁷ The income quartile is missing for patients who are homeless or foreign.

About HCUP

The Healthcare Cost and Utilization Project (HCUP, pronounced "H-Cup") is a family of health care databases and related software tools and products developed through a Federal-State-Industry partnership and sponsored by the Agency for Healthcare Research and Quality (AHRQ). HCUP databases bring together the data collection efforts of State data organizations, hospital associations, and private data organizations (HCUP Partners) and the Federal government to create a national information resource of encounter-level health care data. HCUP includes the largest collection of longitudinal hospital care data in the United States, with all-payer, encounter-level information beginning in 1988. These databases enable research on a broad range of health policy issues, including cost and quality of health services, medical practice patterns, access to health care programs, and outcomes of treatments at the national, State, and local market levels. For more information about HCUP, visit www.hcup-us.ahrq.gov/.

¹⁷ Claritas. Claritas Demographic Profile by ZIP Code. <https://claritas360.claritas.com/mybestsegments/>

About the NIS

The HCUP National Inpatient Sample (NIS) is a nationwide database of hospital inpatient stays. The NIS is nationally representative of all community hospitals (i.e., short-term, non-Federal, nonrehabilitation hospitals). The NIS includes all payers. It is drawn from a sampling frame that contains hospitals comprising more than 95 percent of all discharges in the United States. The vast size of the NIS allows the study of topics at the national and regional levels for specific subgroups of patients. In addition, NIS data are standardized across years to facilitate ease of use. Over time, the sampling frame for the NIS has changed; thus, the number of States contributing to the NIS varies from year to year. The NIS is intended for national estimates only; no State-level estimates can be produced.

The 2012 NIS was redesigned to optimize national estimates. The redesign incorporates two critical changes:

- Revisions to the sample design—starting with 2012, the NIS is now a *sample of discharge records from all HCUP-participating hospitals*, rather than a sample of hospitals from which all discharges were retained (as is the case for NIS years before 2012).
- Revisions to how hospitals are defined—the NIS now uses the *definition of hospitals and discharges supplied by the statewide data organizations* that contribute to HCUP, rather than the definitions used by the American Hospital Association (AHA) Annual Survey of Hospitals.

For more information about the NIS, visit www.hcup-us.ahrq.gov/nisoverview.jsp.

About the NRD

The HCUP Nationwide Readmissions Database (NRD) is a calendar-year, discharge-level database constructed from the HCUP State Inpatient Databases (SID) with verified patient linkage numbers that can be used to track a person across hospitals within a State. The NRD is designed to support various types of analyses of national readmission rates. The database includes discharges for patients with and without repeat hospital visits in a year and those who have died in the hospital. Repeat stays may or may not be related. The criteria to determine the relationship between hospital admissions are left to the analyst using the NRD. The NRD was constructed as a sample of convenience consisting of 100 percent of the eligible discharges. Discharge weights for national estimates are developed using the target universe of community hospitals (excluding rehabilitation and long-term acute care hospitals) in the United States. Over time, the sampling frame for the NRD will change; thus, the number of States contributing to the NRD will vary from year to year. The NRD is intended for national estimates only; no regional, State-, or hospital-specific estimates can be produced.

For more information about the NRD, visit www.hcup-us.ahrq.gov/nrdoverview.jsp.