

Emergency admissions of ambulatory care sensitive conditions at a Japanese local hospital: An observational study

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Abstract

Background: Emergency admissions of ambulatory care sensitive conditions (ACSCs) are a key marker of quality of primary care and are used nationwide in some countries including the UK and Australia. There are still little data on ACSCs available in Japan. This study aimed to provide the descriptive data of the current state of ACSCs at a local hospital in Japan.

Methods: This is an observational study of retrospective chart review. The study setting is Funabashi Futawa Hospital (FFH), an acute care private hospital in Funabashi City, Japan. We analyzed the shares of admissions of ACSCs out of all admissions at FFH from April 2014 to March 2015.

Results: 5380 charts were reviewed. Emergency admissions were 3275 cases (61%) of all admissions. Emergency admissions for ACSCs accounted for 946 cases (28.9%) of all emergency admissions. Chronic ACSC is the most common subcategory. Urinary tract infection accounted most for admissions of acute ACSCs (138 cases, 4.2% of all emergency admissions). Asthma accounted most for admissions of chronic ACSCs (139 cases, 4.2%). Pneumonia accounted most for admissions of vaccine-preventable ACSCs (99 cases, 3.0%).

Conclusions: This is one of the first reports describing ACSCs in Japan. Most common reasons for ACSCs were similar to the previous data from the UK, except COPD ranked lower and asthma ranked higher, respectively. Comparison among different facilities (horizontal) and over time in the same institution (longitudinal), as well as analyzing relationships between other markers of primary care quality and ACSCs, will be necessary in the future.

KEYWORDS

epidemiology, statistics

1 | INTRODUCTION

Ambulatory care sensitive conditions (ACSCs) are those conditions for which interventions in primary care could prevent outpatients from hospitalization.^{1,2} Emergency admissions for ACSCs are a key marker of quality of primary care and are used nationwide in some

countries including the United Kingdom (UK) and Victoria state in Australia.^{3,4} It is true that healthcare system is complex and not all the factors that cause hospitalization are under direct primary care provider's control.⁵⁻⁷ Some of these factors have little relations with quality of primary care (eg, cultural background, patient's age) and can be the limitations of ACSCs.^{5,7} On the other hand, some of

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these factors are a part of accessibility of primary care (eg, socioeconomic status or geographical factors).⁵ Recent study shows that improvements in access to primary care are associated with fewer admissions for chronic ACSCs especially asthma and hypertension.⁶ Another study shows that higher continuity of primary care is associated with fewer admissions for ACSCs.⁸

In any case, ACSCs are one of the hot topics within primary care research and many papers are published related to this topic.¹⁻¹² However, there are still few reports on ACSCs in Japan⁹⁻¹¹ and they are ones in special situation (an effect of earthquake),^{9,10} one on rural islands and with few admissions (38 ACSC admissions)¹¹ and just a case report.¹² No data exist on the city in the usual state against which anyone can use as a benchmarking indicator. A yardstick is necessary to measure anything. This study aimed to provide the very first data of the current state of ACSCs at the typical local hospital in Japan as a sounding board where discussion can start about the quality of primary care in a local community.

2 | METHODS

The study design is an observational study of retrospective chart review, and no other databases are used or linked. The study setting is Funabashi Futawa Hospital (FFH), an acute care private hospital (299 beds). It is an emergency and critical care hospital for both adults and children, located in Funabashi City (population of 0.62 million as of 2015), Chiba Prefecture, Japan.¹³ Basic data of our medical service area, Tokatsu-nanbu, are as follows (as of 2015) {average of Japan}: population is 1.7 million; population increase/decrease rate is 1.67% {−0.75%}; rate of the older population (persons 65 years old and older) is 22.2% {26.3%}; population density is 6850.1 people/km² {340.8 people/km²}; the number of clinics is 958 (55.10/100 thousand people) {67.88/100 thousand people}; the number of hospital is 61 (3.51/100 thousand people) {6.58/100 thousand people}; the number of physicians is 2871 (165/100 thousand people) {246/100 thousand people}¹⁴; and the number of emergency and critical care hospital for children is 2 and FFH is one of them.

The admission records of all patients admitted to FFH between April 2014 and March 2015 were reviewed manually for analysis. Main outcome measure is the shares of three ACSC categories defined by Bardsley et al⁴ (Table 1), which includes 22 diagnoses divided into three subcategories (acute, chronic, and vaccine-preventable [VP]) out of all admissions. Secondary outcome measures are age, gender, category of admissions (emergency or planned), and the reason for admission (primary diagnosis). If there are patients who admitted more than once during the study period, each admission was counted as a separate unique admission. We calculated the share of emergency admissions out of all admissions and the shares of each ACSC admission out of emergency admissions. We also divided all ACSC admissions into three groups by age (the age of 0-19 years, the age of 20-69 years, and the age of 70 years and older) and calculated ACSC admissions' share on them. We had unrestricted access to all admission charts, and there were no missing data.

TABLE 1 Definition of ACSCs⁴

Acute ACSCs
Cellulitis
Dehydration
Dental conditions
Ear, nose, and throat infections
Gangrene
Gastroenteritis
Nutritional deficiencies
Pelvic inflammatory disease
Perforated/bleeding ulcer
Urinary tract infection/pyelonephritis
Chronic ACSCs
Angina
Asthma
Chronic obstructive pulmonary disease
Congestive heart failure
Convulsions and epilepsy
Diabetes complications
Hypertension
Iron deficiency anemia
Vaccine-preventable ACSCs
Influenza
Pneumonia
Tuberculosis
Other vaccine-preventable

The study was approved by the FFH's ethics committee.

This paper is prepared according to RECORD statement,¹⁵ which is the extended version of STROBE statement.¹⁶

3 | RESULTS

5380 admission charts were reviewed. Emergency admissions were 3275 cases (61% out of all admissions). Emergency admissions for ACSCs accounted for 946 cases (28.9% out of all emergency admissions) (Figure 1). Emergency admissions of 0- to 4-year-old children were the highest out of all age-groups, at 542 cases (16.5%). Women between the ages of 20-44 years who underwent emergency admissions accounted for 552 cases, and 428 cases of which were related to pregnancy and delivery. Emergency admissions of 70 years and older accounted for 1372 cases (41.9%; Figure 2).

Urinary tract infection accounted most for admissions of acute ACSCs to 138 cases (4.2% of all emergency admissions). Asthma accounted most for admissions of chronic ACSCs to 139 cases (4.2%). Pneumonia accounted most for admissions of vaccine-preventable ACSCs to 99 cases (3.0%). Other notable reasons for admissions of ACSCs were gastroenteritis at 94 cases (2.9%, No. 2 of acute ACSCs), congestive heart failure at 121 cases (3.7%, No. 2 of chronic ACSCs),

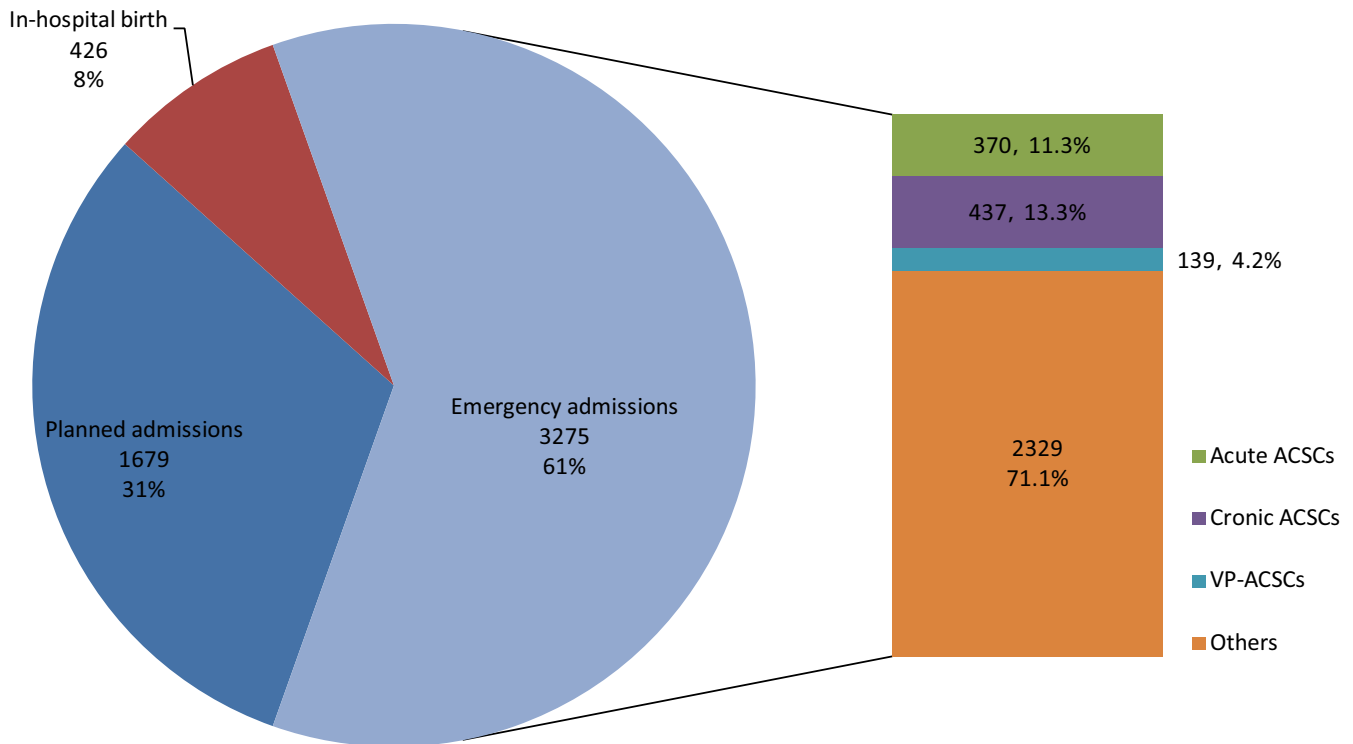


FIGURE 1 Type of admissions and shares of each category of ACSCs

and convulsions and epilepsy at 79 cases (2.4%, No. 3 of chronic ACSCs; Figure 3).

Among the three groups by age, the age of 70 years and older accounted most for ACSC admissions at 409 cases (12.5% out of all emergency admissions; 43.2% out of all ACSC admissions), followed by the age of 0-19 years for 342 cases (10.4%; 36.1%) and the age of 20-69 years for 195 cases (5.9%; 20.6%).

4 | DISCUSSION

In summary, emergency admissions were 61% of all admissions. Emergency admissions of 0- to 4-year-old children were the highest out of all age-groups. Emergency admissions for ACSCs accounted for 28.9% of all emergency admissions. Urinary tract infection accounted most for admissions of acute ACSCs. Asthma accounted most for admissions of chronic ACSCs. Pneumonia accounted most for admissions of vaccine-preventable ACSCs.

Most of emergency admissions of the women between the ages of 20-44 years were related to pregnancy and delivery. This may be the reason why women had a higher admission rate compared to that of men in the same age-group.

The previous study by Leonie et al¹⁷ have estimated that 73% of admissions of ACSCs would be actually preventable. Based on our hospital administration data, the average medical expense per each admission at FFH is 606 000 JPY (about 5770 USD). Therefore, the total cost for the preventable admissions of ACSCs would be 418 million yen/y (3.99 million dollars/y).

Strengths and limitations: The strengths of this study are four-fold. (a) This is the first and the largest study in Japan with detailed breakdown of each ACSC category and diagnosis. There are two studies with larger numbers than ours^{9,10} but with no detailed breakdown of diagnosis, and there is one study with detailed breakdown¹¹ but only 38 ACSC admissions. (b) This is the very first study in Japan providing the data on the proportion of ACSCs out of entire admissions or emergency admissions. None of three previous studies⁹⁻¹¹ provides such data. (c) This is the first study in Japan including the age younger than 20. Two studies include 20 years old and older,^{9,10} and one includes only 65 years or older.¹¹ (d) This is the only study using Bardsley's ACSC definition.⁴ Bardsley's list was developed based on a set identified by Victoria State Health Department,¹⁸ which was also the basis of common NHS subset of ACSCs identified by Purdy³ with adjustment after reviewing and integrating 13 different previously existing definitions so that they can be considered as ACSCs across different countries. Bardsley's list also has been widely used in informing WHO country assessments in Kazakhstan, Latvia, and the Republic of Moldova¹⁹⁻²¹ and endorsed by WHO Europe when assessing health service delivery performance with hospitalizations for ACSCs.²²

We point out three limitations on our study. First, this study only evaluates the data of a single hospital. However, single-center study in Brazil has been published previously²³ providing great insight over its health policy administration. Also, as FFH is one of only two emergency and critical care hospitals for children in the region, our data may well represent the characteristics of the area. Second, this is 1-year descriptive analysis, which does not provide information on time trends. Third, we did not adjust the data with

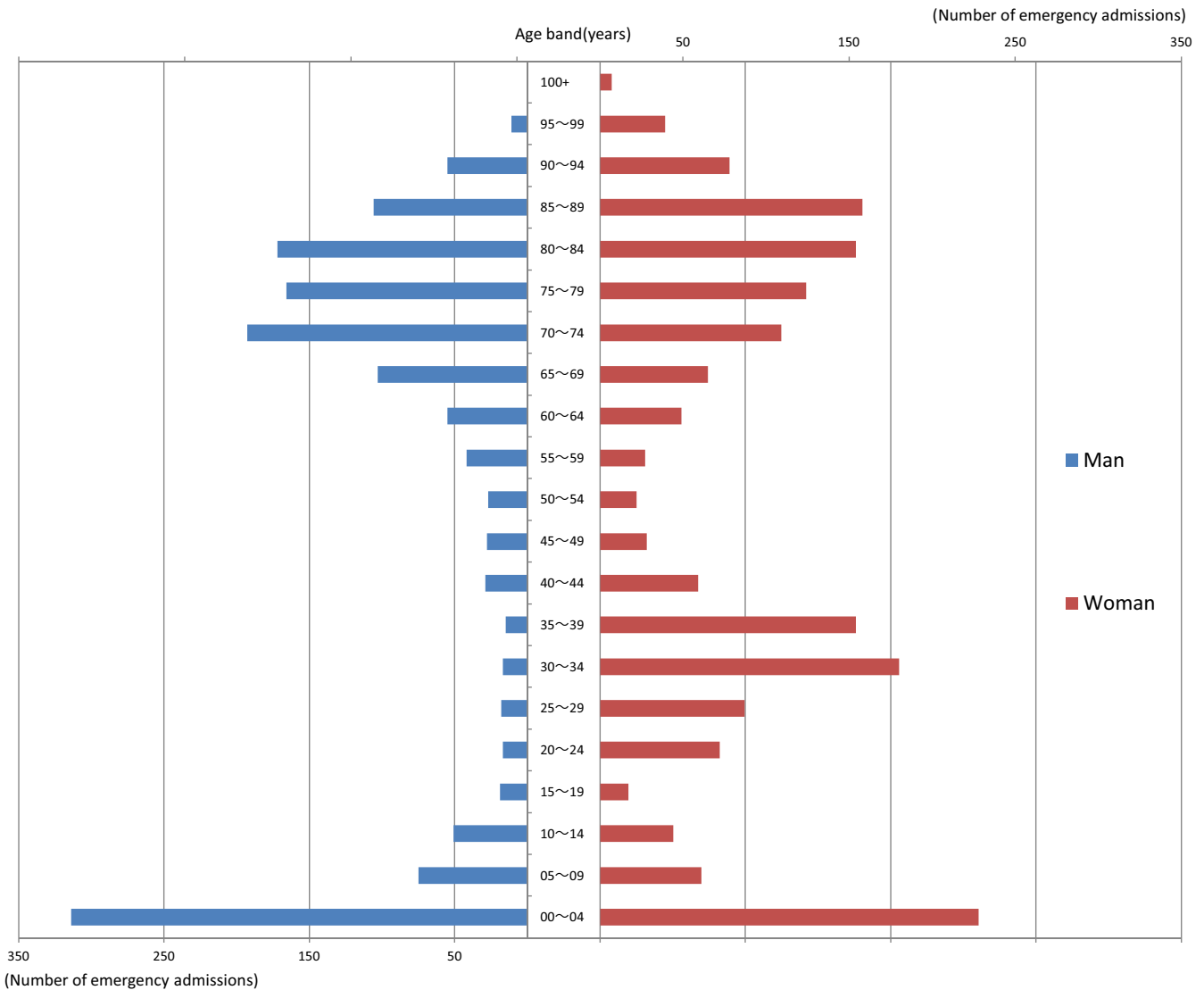


FIGURE 2 Breakdown of age and gender of emergency admissions

the characteristics of the local population. This makes comparisons between the regions a bit tricky.

Comparison with existing literature: The shares of ACSCs out of all admissions in the UK as a whole were 18.2%-19.1% (April 2001-March 2010),⁴ which is much less compared to our data at FFH (28.9%). It is clear that we cannot simply compare these statistics, since risk adjustment based on the two countries' demographics is needed. However, since the primary care in the UK is well established and has a long history, whereas Japan is not, there is a possibility that the difference of the quality of the primary care between two countries is reflected in the difference of the finding. According to population pyramid of the UK during 2001-2010, the share of the age of 70 years and older was 11.4%-11.9% out of population,²⁴ whereas it was 15.5% at Funabashi City in 2014.¹³ Since the age of 70 years and older accounted most for ACSC admissions, this may be one of the reasons for the difference. Thus, age adjustment may be one of the important processes to compare data on ACSCs. In our study, chronic ACSCs are the largest category among all ACSCs, followed by acute

ACSCs and then VP-ACSCs. These findings are consistent with two studies in Japanese^{9,10} and one study abroad⁴ but not consistent with one study.¹¹ It may be because population of Kaneko's study¹¹ is limited to the elderly. Most common reasons for emergency admissions of acute and vaccine-preventable ACSCs were similar between the UK and FFH. But chronic obstructive pulmonary disease (COPD) accounted most for admissions of chronic ACSC in the UK,⁴ whereas it only accounted for 0.7% of emergency admissions at FFH. According to a document published by the Japanese government, it is estimated that admissions of COPD patients account for twice as much as that of bronchial asthma in Japan.²⁵ The fact that FFH admits more children than other hospitals in the district may explain the difference.

According to NHS, eight conditions account for three-quarters of all ACSCs.²⁶ Similarly, the top eight conditions account for 79% of all ACSCs in our study. However, conditions included are slightly different (Table 2). It is striking that the second, the third, and the fifth common ACSCs (urinary tract infection/pyelonephritis, congestive heart failure, and gastroenteritis) in our

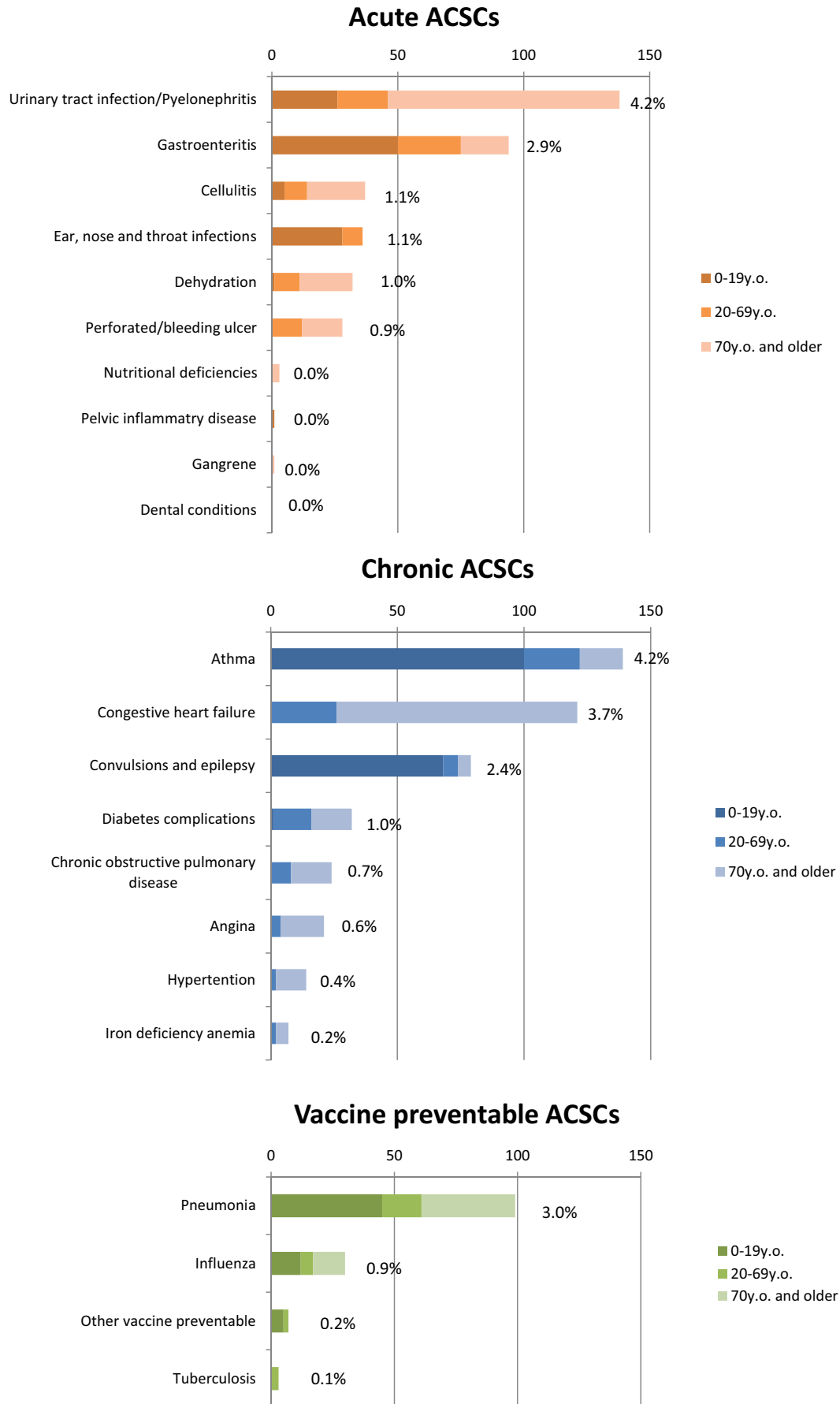


FIGURE 3 Numbers and shares of each ACSC admission

TABLE 2 Top eight conditions of ACSCs

Our study	NHS ²⁶
Asthma	Asthma
Urinary tract infection/ pyelonephritis	
Congestive heart failure	
Pneumonia	Pneumonia
Gastroenteritis	
Convulsions and epilepsy	Convulsions and epilepsy
Cellulitis	Cellulitis
Ear, nose, and throat infections	Ear, nose, and throat infections
	Influenza
	Chronic obstructive pulmonary disease
	Diabetes complications

Note: Orders are by the most frequent to the least in our study. NHS list does not correspond with their frequency order.

study which accounts for 37% of all ACSCs do not show up in the NHS's list. They may be doing better job preventing admissions from those conditions by better care, or we are providing poorer care than them. The other possibility is that criteria or threshold for admission for those conditions are largely different. Also, the opposite may be true for the influenza, COPD, and diabetes complications, which are only seen in NHS's top list. These findings may be only true with the local community of FFH but could be universal throughout Japan.

Implications for research and/or practice: Comparison among different facilities (horizontal) and over time in the same institution (longitudinal) as well as the investigation of the relationships between the other markers of primary care quality and ACSCs will be necessary in the future. Also, factors affecting the frequency of ACSC admissions need to be investigated as only natural disaster and patient experience have been researched. Only quantifying the status quo, we can visualize the room for improvement and plan for change in terms of cost reduction or work burden reduction for hospital staff, which has never been more important than before in the face of current workstyle reform movement led by the Japanese government. In the local context, these descriptive data provide the starting point for dialogue between primary care facilities and secondary care hospitals as well as the tools for concrete feedback. Our hope is that ACSC data are routinely and easily available throughout Japan and comparison between regions or quality improvement activities is stimulated by them.

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CONFLICT OF INTEREST

The authors have stated explicitly that there are no conflicts of interest in connection with this article.

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