

**Review article**

**Demographic Background for the Emergence of “Nursing and HealthCare-Associated Pneumonia (NHCAP)” in Japan — Three Key Viewpoints that Need to Be Considered in Handling the Rapidly Growing Number of the Elderly Afflicted by NHCAP as well as Other Acute and/or Chronic Diseases**

Harumi Kuno-Sakai, MD, PhD<sup>1)</sup>, Mutsuo Fukushima<sup>2)</sup>, Hideto Sakai, MD, PhD<sup>3)</sup>

(completed translation on February 10, 2019, uploaded on March 1, 2019)

<sup>1</sup> Director, Geriatric Health Services Facility Towada run by Social Welfare Corporation Miyagikai in the SG Group, Towada City, Aomori 034-0107 Japan, Former professor at Tokai University School of Medicine's Department of Public Health and Pediatrics in Isehara City, Kanagawa Prefecture, Japan. Former President of the Japanese Society of Clinical Virology

<sup>2</sup> Regular member of the Japanese Society of Clinical Virology. · Journalist, former staff reporter at the World Services Section of Kyodo News' International Department, Shiodome Media Center, 1-7-1 Higashi-Shimbashi, Minato-ku, Tokyo, 105-7201 Japan

<sup>3</sup> Director, Geriatric Health Services Facility Shimoda run by Jinsenkai, a medical corporation run by the SG Group of nursing-care facilities for the elderly. Former Deputy Director of Keio University Hospital in Shinanomachi, Shinjuku, Tokyo, Professor Emeritus of Tokai University School of Medicine's Nephrology and Diabetes section at the university's Department of Internal Medicine, 259-11 Isehara City, Kanagawa Prefecture, Japan

**Corresponding author:**

Harumi Kuno-Sakai, MD, Director, Geriatric Health Services Facility Towada, run by Miyagikai, a social welfare corporation of the SG Group of nursing-care facilities for the elderly, Towada City, Aomori 034-0107, former professor at Tokai University School of Medicine's Department of Public Health and Pediatrics, Isehara City, Kanagawa Prefecture, Japan. Former President of the Japanese Society of Clinical Virology

Japan Tel: +81- 176-27-3131

e mail address:[clin.viol@nifty.com](mailto:clin.viol@nifty.com)

**Key words:**Demographic Chart, Nursing and HealthCare-Associated Pneumonia  
Aspiration pneumonia, Aging death, Nursing care insurance system

## 1. Population Statistics compiled by the Japanese government's Ministry of Health, Labor and Welfare (MHLW)

The average life expectancy of the Japanese as of 1945, when Japan surrendered to the U.S.-led Allied Powers in World War II unconditionally, was 50.06 years at males and 53.96 at females.

The Japanese populace's average life expectancy has been growing steadily since then over the past seven decades. In 2017, it came as high as 81.09 years at males and 87.26 years at females. (Figure 1) The gulf between the averages in 1947 and 2017 tops 30 years, which can be roughly described as the “span of one generation” in modern men's reproductive cycle.

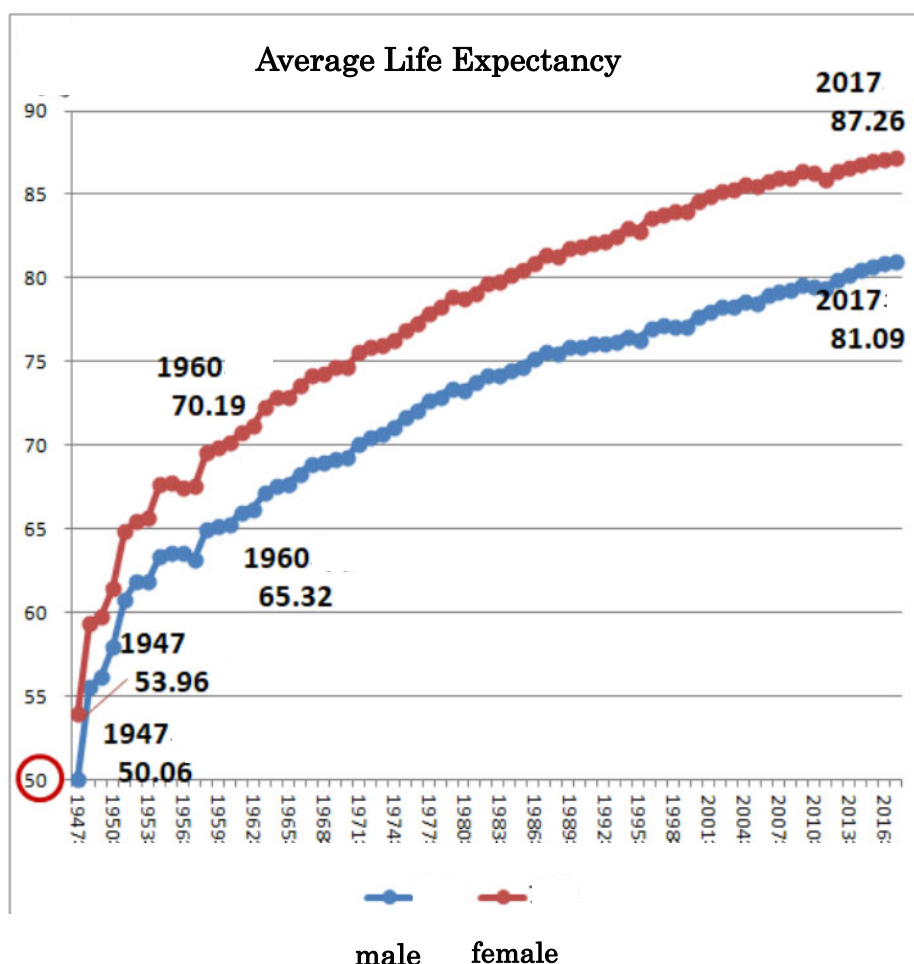


Figure 1. Average Life Expectancy (1947~ ) <sup>1)</sup>

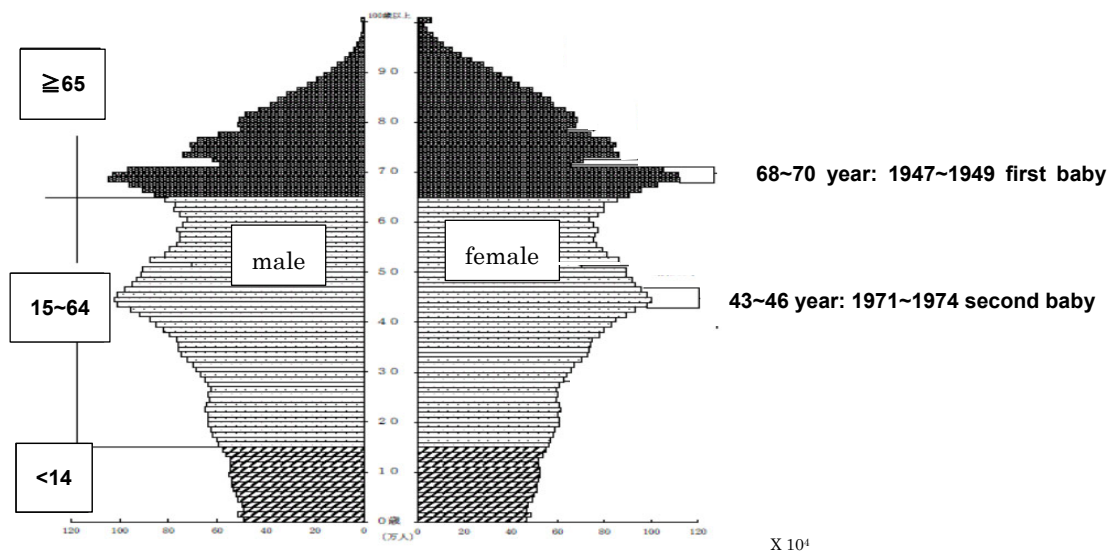
The Japanese born during the “first baby-boom (1947-1949)” that came in the immediate aftermath of World War II following the massive return home of soldiers from foreign battlefields as well as those of their preceding two or three generations are now aged 65 or over ( $\geq 65$ ). The number of babies born in 2017 fell by 30,000 from the previous year to 906,060, a record low, while the total fertility rate – the average number of children a Japanese woman gives birth to during her lifetime – was as low as 1.43 during the year due to high abortion and contraception rates, according to the statistics released by MHLW on June 1, 2018.

Consequently, the nation’s demographic structure in 2017 represents that of a rapidly graying society languishing under a very low birth rate. In other words, Japan has become a full-fledged aged society. (Figure 2) The phenomenon can be described as the “emergence of the gigantic fourth generation of old people” – or the huge mass of the elderly – which are putting heavy financial and fiscal burdens on younger generations with regards to resources at both their family budgets and the national coffers.

This “fourth generation of great grand-parents” now sits atop the three younger generations consisting of grand-parents, parents and children. Analyzing this economically precarious demographic structure, we can properly say that the fourth generation is supported by incomes, economic goods and services being produced by the current working age-populace, which in itself does not expand speedily enough to sustain and maintain the healthy economic foundations of Japanese society amidst the low birthrate being weighed heavily down by rampant abortions and contraceptive practices.

Against this background, Finance and Deputy Prime Minister Taro Aso told a lecture meeting in Fukuoka Prefecture on February 3, “Under the national government-managed health insurance system that provides coverage to all Japanese citizens, every six persons aged between 16 and 64 support every one person aged 65 or over.” While describing the growing average life expectancy as “a wonderful phenomenon,” Aso, a former prime minister, candidly said, “The problem lies in the attitude of the Japanese who have chosen to limit the number of their children whom they should have given birth to.”

Demographic Chart (2017/10/1)



Demographic Chart (1975)

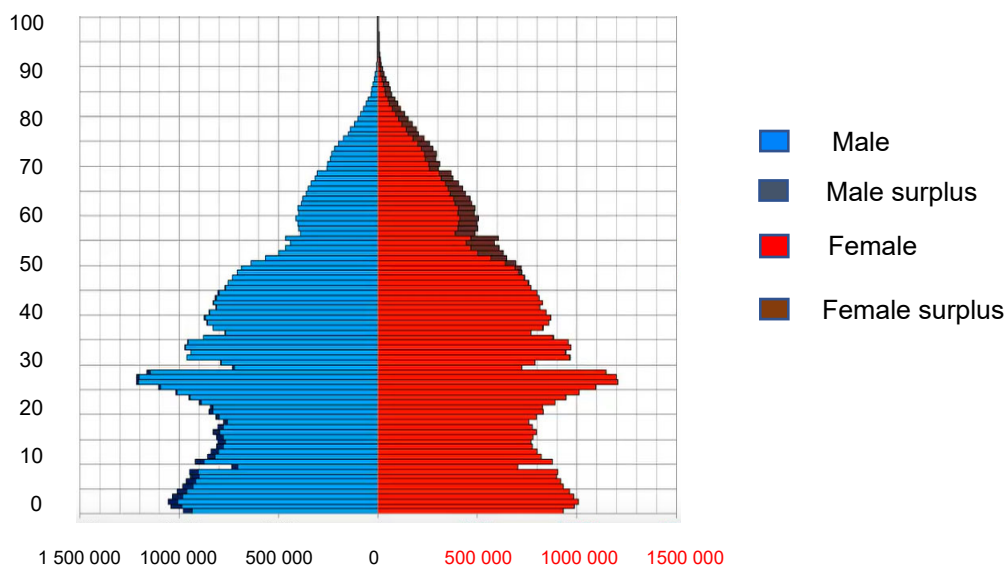


Figure 2 (part 1). Demographic Chart (2017/10/1) above and Demographic Chart (1975) below <sup>2,3)</sup>

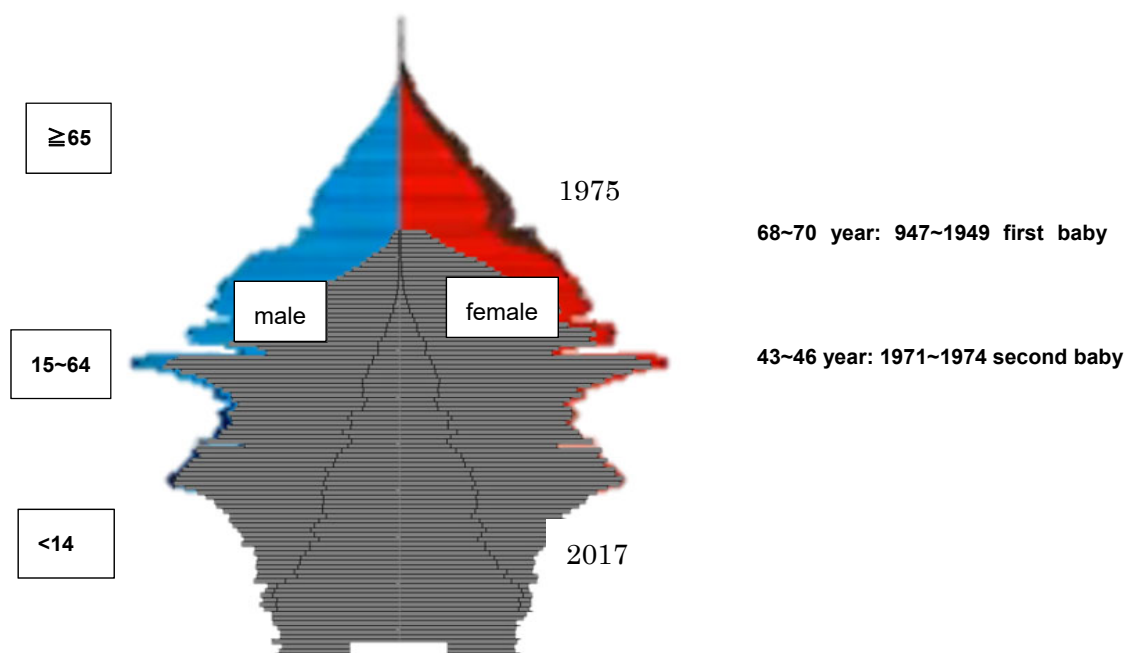


Figure 2 (part 2). Deographic Chart (2017/10/1) top and Demographic Chart (1975) bottom <sup>2,3)</sup>

The 2017 gray demographic chart was placed on top of the 1975 blue-and-red chart, with the two projections representing the 1947-1949 baby boomers and 1971-1974 baby boomers overlapping & appearing as the same projections perfectly. The pile of the two charts show that the Japanese have limited their family sizes once Japan passes the mid-1970s to make it impossible for the third projections to spring up. This trend is likely to hound the nation, putting heavy strains on the national coffers as a result of diminishing tax revenues and burgeoning needs for larger welfare outlays.

Now, let's briefly examine the issue of this rapidly aging society accompanied by such an ultra-low birthrate from the standpoint of the post-World War II history of two decades of speedy economic expansion rates entailed by five decades of slower growth rates and a subsequent economic contraction that followed the slowdown.

It is noteworthy that Japan's gross domestic product (GDP) expanded at annual rates of more than 10 percent between 1953 and 1975 on a nominal basis,

namely, a statistical basis compiled before inflation rates are subtracted from GDP growth rates. The Japanese who are now 65 years or older can take the credit for what economists and news organizations now nostalgically describe as “Japan’s high-speed economic expansion era” in view of the prosperity brought about by these hard-working generations’ industrious labor and great efforts. But those who can take credit for those brilliant high-speed growth years and for subsequent years of moderate or slower economic growth before the current contraction kicks in following the late 1980s burst of the asset price-inflated bubble economy are all now retirees.

In other words, the fourth generation of great grand-parents are now going through the “phase of a sun-set” of their lives. They are now physically weaker and susceptible to various kinds of acute and chronic diseases, both infectious and non-infectious.

## **2. Three main causes of Japanese’ deaths**

The three major causes of deaths of the Japanese are (1) Malignant tumors, (2) Cardiac diseases and (3) Pneumonia. Malignant tumors and cardiac diseases are large categories of diseases that manifest a wide range of symptoms and whose affected organs or body parts also vary widely. Hence, the pneumonia whose sole affected organ is the lung and whose bronchopulmonary symptoms are almost identical among its varieties can be called “the number one killer disease” in Japan. (Figure 3)

MHLW statistics on sex-specific and age-specific causes of deaths of the Japanese underscore the fact that the frequency of pneumonia-associated deaths is the highest among the elderly. The rapid graying of the Japanese populace has contributed to making pneumonia into the No. 1 killer in Japan.

# Sex-Age group-specific causes of death -by number of death (2016)

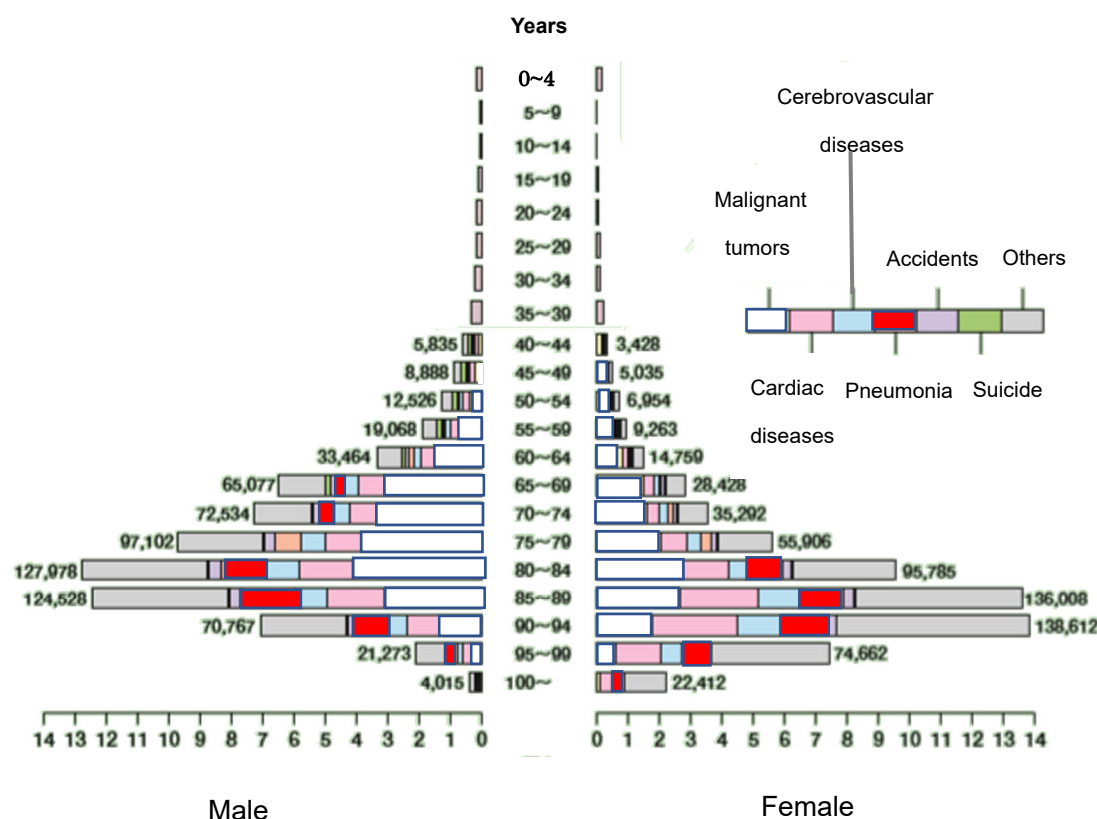


Figure 3. Sex-Age group-specific causes of death -by number of death (2016) <sup>4)</sup>

Figure 4a enables an analytical assessment of age group-specific statistical numbers of deaths by non-pneumonia diseases vs. deaths by pneumonia among males in 2016. It demonstrates that Japanese males most commonly pass away at ages between 80-84 (The death total at this age group came to 127,976 in 2016. Of the number, 14,458 died of pneumonia). As for males aged between 85 and 89, the most common cause of their deaths was pneumonia (The death total in this age bracket was 124,531 in 2016. Of this number, 17,611 died of pneumonia).

As for females, meanwhile, Figure 4b enables an analysis of age group-specific numbers of non-pneumonia causes-associated deaths among females vs. those of deaths by pneumonia. It shows that Japanese females most commonly pass away at ages between 90 and 94. The number of deaths in this age group came to 138,613 in 2016. Of the number, 15,131 died of pneumonia.

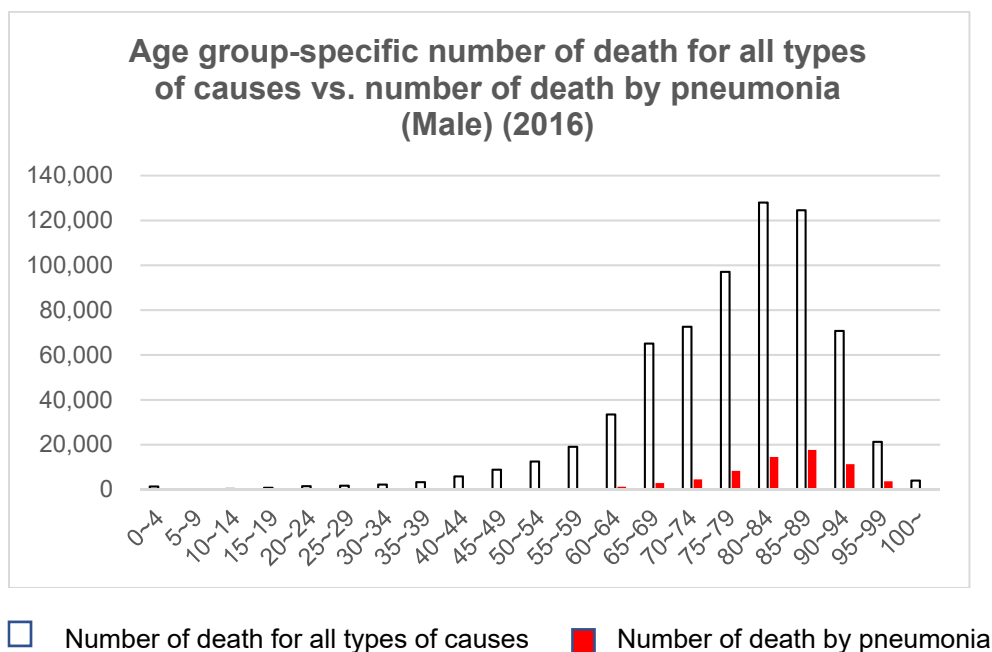


Figure 4a. Age group-specific number of death for all types of causes vs. number of death by pneumonia (Male) (2016)<sup>5)</sup>

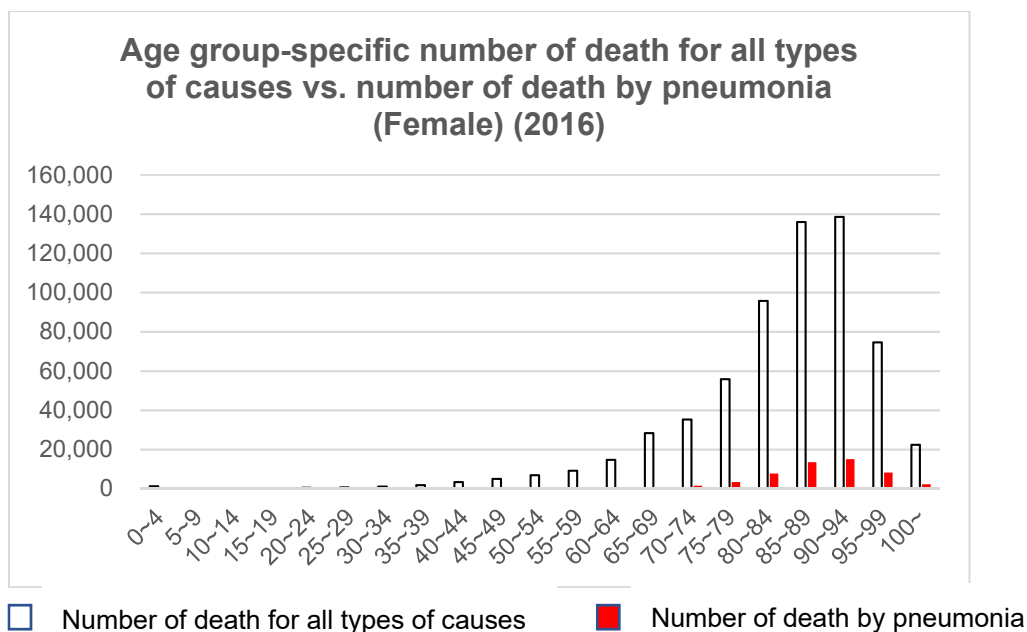


Figure 4b. Age group-specific number of death for all types of causes vs. number of death by pneumonia (Female)<sup>5)</sup>



### **3. Pneumonia**

Pneumonia is the inflammation of the lung parenchyma characterized by consolidation of the affected part, the alveolar air spaces being filled with infection with bacteria or viruses. A few pneumonia cases result from the exudate, inflammatory cells and fibrin. Pathogens vary. Most pneumonia cases stem from inhalation of molds like aspergillus as well as from infection with chlamydia and mycoplasma. Interstitial pneumonia is one of the most important pneumonia types of ambiguous origins.

A burgeoning number of aspiration pneumonia cases at the elderly is assuming alarmingly serious importance against the backdrop of Japan's rapidly aging society. This type of pneumonia is considered to result from bacterial infections. But it is important to note that pathogenic microbes in most cases of aspiration pneumonia are not identified because most of patients of aspiration pneumonia have been admitted to, and now reside collectively at, geriatric nursing-care facilities. In other words, these people are not being treated at hospitals equipped with diagnostic equipment like an X-ray imaging machine and other tools like bacterial culture and identification equipment and kits and examination specialists necessary to identify pathogenic microbes.

It is possible that many among a growing number of the elderly -- who have been admitted to, stay at, and are now receiving nursing care at, geriatric health care facilities -- may easily develop aspiration pneumonia because some types of bacteria, which are oftentimes present at human beings' nasopharynx, oropharynx or at the pharyngeal opening of their auditory tubes -- making up bacterial flora in such areas -- can become pathogens for this disease amid an opportunistic infection that can pound out such residents, whose immune systems may have been compromised due to their old ages and resultant natural physical decays and debilitations.

Sometimes, this type of pneumonia at the seriously debilitated elderly can result from the inhalation of foreign material, usually food materials, into the bronchi because their swallowing and cough reflexes have been weakened or even paralyzed by old age-associated debilitations and blood vessel problems like a thrombus that affect their central nerve system including medulla oblongata,

which is a brain area responsible for regulating these reflexes. This type of pneumonia can also develop secondary to the presence in the airways of saliva and other types of fluid into which such bacterial flora gets commingled when such patients drink or may suck in such fluid inadvertently.

Moreover, the inflows of nasopharyngeal and oropharyngeal secretions, which can facilitate the inhalation of food materials from the mouth or these relevant areas to the lower parts of airways via the pharynx, can occur especially at the bedridden, unconscious and paralyzed patients against the backdrop of their weakened or paralyzed cough and swallowing reflex. These are risk factors for this type of pneumonia.

Here, it is appropriate to recall the complicated physiological mechanism of a swallowing reflex, which is regulated by a medulla oblongata and other parts of the brainstem. It is also fitting to recall that these reflex centers are responsible for the automatic control of a human's act of swallowing, which is vital to the human's life.

The reflex involves the larynx, which is innervated by the interior and exterior branches of a superior laryngeal nerve. In the reflex, an epiglottis covers the entrance of the larynx with the glottis closing the airway, leading the epiglottis closing over the glottis, when an individual swallow. While food bolus suitable for swallowing is being prepared, the bolus activates oropharyngeal sensory receptors that initiates the deglutition reflex.

If a resident at a geriatric nursing health care facility were unconscious, paralyzed or an old ailing person, the reflex could be obstructed or even may not occur due to damages that have been already inflicted to his or her brainstem, which involves the hampering of the transmission of sensory or motor impulses and signals through afferent and efferent nerves to and from the brainstem. The supply of oxygen and nutrition through brain blood vessels are sometimes obstructed at such persons, with the problem inducing the malfunctions of medulla oblongata and the brainstem, thereby, disabling the vital swallowing reflex. (Figure 5)

### Risk factors that can work with pneumonia in residents' spiral to death

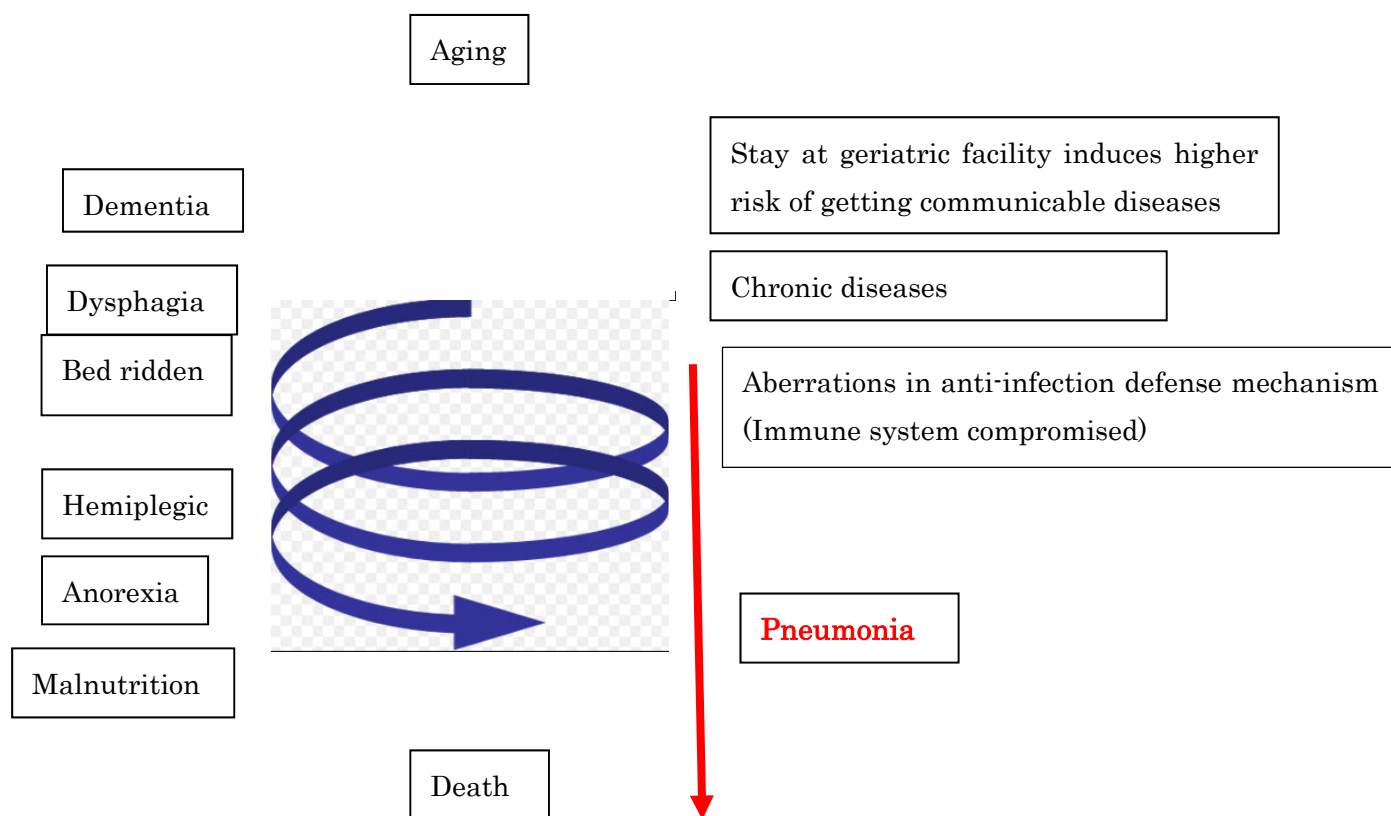


Figure 5. Risk factors that can work with pneumonia in residents' spiral to death

#### 4. Sex-age group-specific causes of death

Figure 6 spotlights sex/age group-specific causes of deaths in terms of percentages. In both genders, rates of death by pneumonia are higher than those stemming from other causes in a wide range of age groups, starting at those of the age group of 60-64 years all the way up to the age group of  $\geq 100$ , compared with statistical findings concerning causes of death at younger age groups.

### Sex-Age group-specific causes of death in percentages (2016)

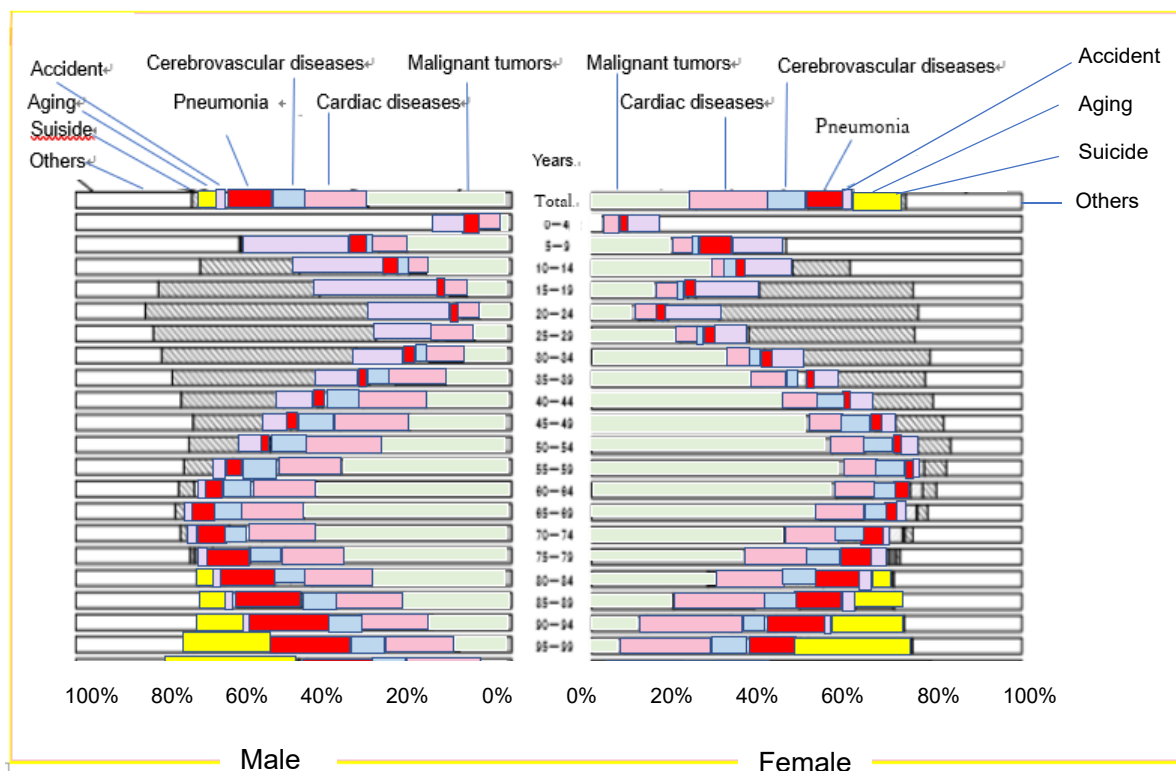


Figure 6. Sex-Age group-specific causes of death in percentages (2016)

Tables 1a and 1b show sex/age group-specific causes of death in terms of percentages of death by pneumonia and that by aging. The two tables show that rates of death by pneumonia become increasingly higher as ages at both males and females advance gradually to enter the age group of 95~99 before such rates fall fractionally at even higher age groups.

In Japan, the elderly either stay at home or are admitted to various types of geriatric nursing health-care facilities, some of which can provide a limited scope of medical services due to the legally mandated presence of a doctor at such venues, depending on types of the facilities. Usually old resident-patients at such facilities are not given an opportunity to be examined by radiographers with knowledge and skills to operate an X-ray imaging machine, because laws do not obligate such facilities to hire such radiographers and fit their facilities with the X-ray imaging machine to avoid burdening such facilities with additional budgetary

requirements in view of their budgetary constraints, although an examination with such machines by such trained X-ray technicians is critically necessary to diagnose a person's symptoms as the consequence of pneumonia.

When an old person contracts pneumonia, the person oftentimes manifest general symptoms not typical of pneumonia such as inactivity and anorexia, instead of showing typical pneumonia-associated symptoms such as respiratory tract infection which include fever, cough, sputum and dyspnea. If the person had already reached a terminal stage, their body temperatures tend to post below-normal levels and bradycardia can be observed at many cases. Even if a doctor applied a stethoscope to the lower part of their backs, chest coarse crackles may not be audible in cases where the person's lungs were affected by an atelectasis.

If such a terminal-stage patient whom hospital doctors saw actually dies, leading the doctors to comply with the nation's legal requirement to file a report on the cause of death of that person to civil authorities, they tend to record "an old age" as the cause of the patient's death without mentioning a possibility of pneumonia as such cause, because they want to eliminate any possibility of taking the blame for a possible misdiagnosis. Therefore, some or many of such patients whose death causes have been recorded as consequences of his or her old age may have succumbed to pneumonia in actuality, which he or she contracted at the terminal stage of their lives.

Table 1a shows sex/age group-specific numbers of death by pneumonia and their percentages in relation to the total number of deaths at both males and females. At males of the age group of  $\geq 100$ , the percentage was 15.8%, compared with 17.2% at males of the age group between 95 and 98. In comparison, Table 1b shows sex/age group-specific numbers of death by aging at males and females. The percentage was 29.2% at males of the group aged  $\geq 100$  as against 17.3% at those in the age group of between 95 and 98.

**Table 1a. Sex-Age group-specific numbers of death by pneumonia vs. total numbers of death (2016)**

Age	Male				Female			
	Total numbers of death	Pneumonia-assorted death	Pneumonia-assorted death/Total death	Pneumonia assorted death Ranking	Total numbers of death	Pneumonia-assorted death	Pneumonia-assorted death/Total death	Pneumonia assorted death Ranking
65~69	65,067	2,845	4.4%	No.4	28,426	838	2.9%	No.4
70~74	72,632	4,467	6.2%	No.4	35,292	1,552	4.4%	No.4
75~79	97,105	8,259	8.5%	No.3	55,907	3,403	6.1%	No.4
80~84	127,976	14,458	11.3%	No.3	95,783	7,762	8.1%	No.4
85~89	124,531	17,611	14.1%	No.3	136,015	13,549	10.0%	No.3
90~94	70,769	11,277	15.9%	No.2	138,613	15,131	10.9%	No.4
95~99	21,273	3,653	17.2%	No.2	74,663	8,246	11.0%	No.3
100~	4,015	634	15.8%	No.3	22,414	2,288	10.2%	No.3

Table 1a. Sex · Age group-specific number of death by pneumonia vs. total number of death (2016) <sup>5)</sup>

**Table 1b. Sex-Age group-specific numbers of death by aging vs. total numbers of death (2016)**

Age	Male				Female			
	Total numbers of death	Aging-assorted physical decay-caused deaths	Aging-assorted deaths/Total deaths	Aging-assorted death Ranking	Total numbers of death	Aging-assorted physical decay-caused deaths	Aging-assorted deaths/Total deaths	Aging-assorted death Ranking
65~69	65,067				28,426			
70~74	72,632				35,292			
75~79	97,105				55,907			
80~84	127,976				95,783	7,802	8.1%	No.5
85~89	124,531				136,015	19,254	14.2%	No.5
90~94	70,769	5,634	8.0%	No.4	138,613	30,157	21.8%	No.3
95~99	21,273	3,670	17.3%	No.1	74,663	22,824	30.6%	No.1
100~	4,015	1,172	29.2%	No.1	22,414	9,904	44.2%	No.1

Table 1b. Sex · Age group-specific number of death by aging vs. total number of death (2016) <sup>5)</sup>

These data may mean that most males and females at the age group ( $\geq 100$ ) may be now staying at home or have been admitted to, and now stay at, nursing care services-providing facilities, which are widely called with designations of either a Roken or a Tokuyo in Japan, depending on the types and scope of health care services provided at the two types of institutions. In both venues, however, the elderly cannot be examined clinically with an X-ray imaging machine and bacterial-culture and identification tools necessary to detect cases of pneumonia, making it impossible for them to be diagnosed as patients of pneumonia because of the lack of their access to such necessary diagnostic equipment and examination specialists.

This suggests that many or some of the old persons whose death causes have been recorded as old ages(aging) may have actually died of pneumonia.

Tables 1a also shows sex/age group-specific numbers of death by pneumonia at females of the age group of  $\geq 100$ . The percentage of the group was 10.2%, compared with 11.0% at females of the age group 95~98. Meanwhile, the Table 1b, which sheds light on sex/age group-specific numbers of death by aging, says that 44.2% of females at the age group of  $\geq 100$  died of old age, against 30.6% of females at the group of between 95 and 98. These findings at very old females are very similar to corresponding findings at males of the same age brackets. Again, those whose death causes are recorded as aging on their death certificates may have died of pneumonia, which may have dealt a finishing blow to the persons whose health's foundations like a swallowing reflex and immune systems have been already damaged seriously or compromised by their old age-associated debilitations.

## 5. Nursing and health-care associated pneumonia

The issue of pneumonia of the elderly should not be viewed simply as the consequence of their contracting an infectious disease. The issue is closely related with the phenomenon of aging. (Figure 7) The disease occurs against the background of physical conditions characteristic of the aged. Neuromuscular dysfunction, which results from either a cerebral attack or just a cerebral atrophy, is a major risk factor for aspiration pneumonia. When the health levels of the aged in Japan deteriorate to levels requiring nursing care, they are usually admitted to

geriatric facilities, where many physically weak old persons reside together, thus causing those old people to live with a high-risk group of many other old humans who are highly likely to contract, or have already contracted, influenza or other bronchopulmonary infections.

Pneumonia is the leading infectious player which can lead such old debilitated people to get enmeshed in this risky spiral which may eventually bring them to death. In other words, pneumonia is a very common disease which oftentimes puts an end to the lives of the elderly as if it dealt a finishing blow to the persons at the end of their journeys of life.

In recent years, doctors in Japan have come to encounter this type of rapidly expanding cohort of the aged, for the first time in their professional carrier. The policy adopted by the doctors in handling this burgeoning cohort, now already a gigantic group of humans, has been to handle them in the same manner with which they have diagnosed and treated younger working-age people.

Consequently, in cases where the aged become unable to eat, the doctors have generally chosen, without any hesitation, to conduct a surgical operation to build a percutaneous endoscopic gastrostomy (PEG) to supply nutrients to them directly through a PEG tube.

Likewise, doctors at hospitals have prescribed medicines to the aged under the same standards as those with which they have prescribed medicines to younger people. In so doing, they don't care at all about prices of the medicines they prescribe, however expensive they may be, because expenses for medicines, medical diagnostic services and medical treatments they choose are automatically covered by the government-managed medical insurance system that provide coverage to all Japanese citizens, as long as the doctors in question work at hospitals.



## Flow Chart of Diagnosis and Treatment of Pneumonia at Adults

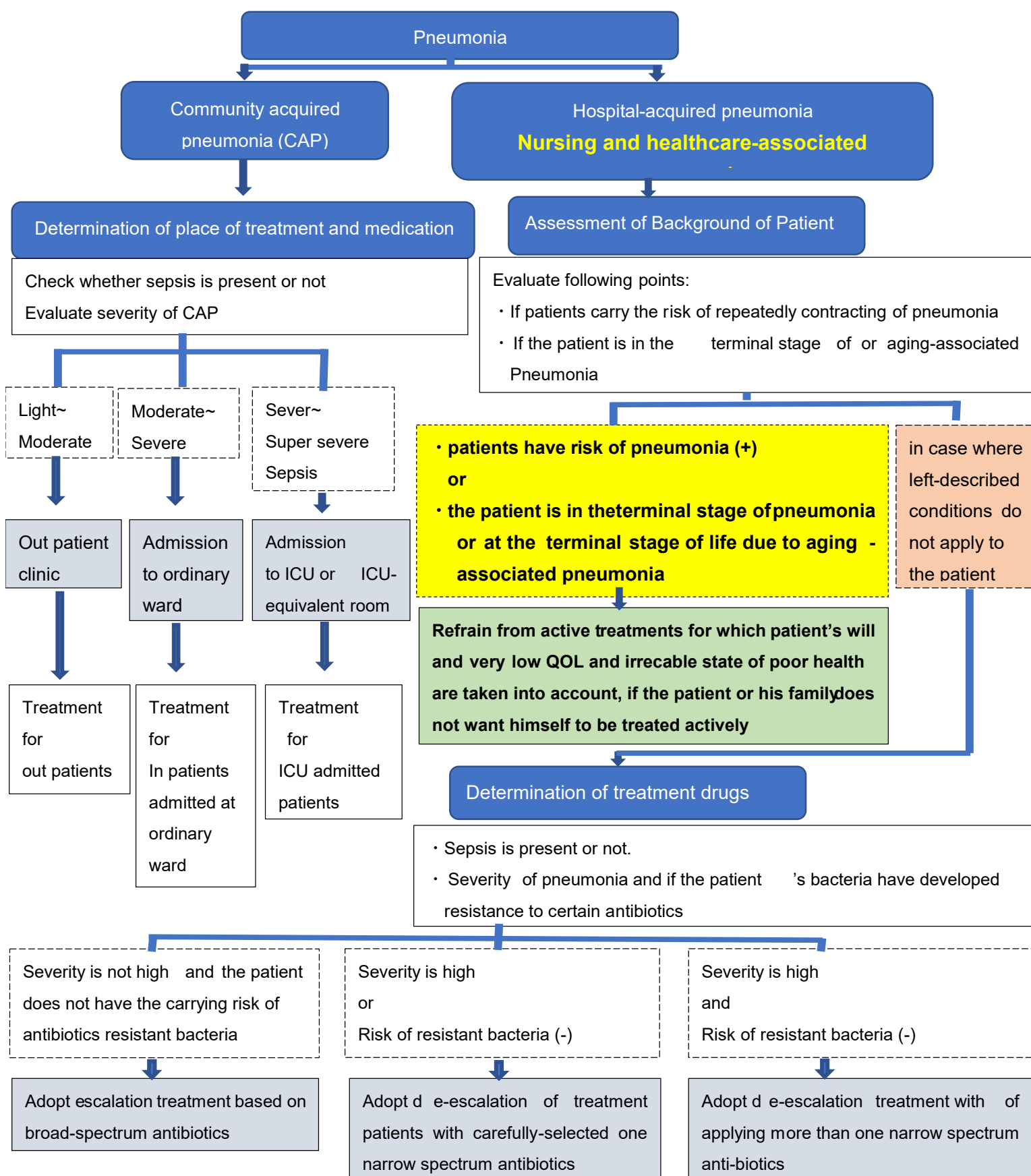


Figure 7 Flow Chart of Diagnosis and Treatment of Adult Pneumonia

In short, hospital doctors in Japan do not apply double standards in treating patients disregards of their ages. First of all, they do not have to exercise such double standards thanks to the government-managed health insurance system. Consequently, their treatment policy has been to keep their patients alive for as long a period as possible. This way of administering medical services to the elderly has forced the Japanese government to chronically spend enormous amounts of budgets for health care in each fiscal year. In fiscal 2018 through March 31, 2019, the government budgeted 11.81 trillion yen for medical outlays under the government-managed insurance system, up from 11.77 trillion yen in the previous fiscal year. Separately from this health insurance outlays, the government budgeted a record 3.12 trillion yen to pay for its expenses for its nursing-care services for the aged in fiscal 2018 under the government-managed nursing-care insurance system.

By now, the government has come to face great difficulties in paying for medical expenses for the aged in a generous manner with which they have treated this cohort in the past. In view of the pressing situation, authors of this medical dissertation have decided to present three key viewpoints to help politicians, bureaucrats, citizens and relevant professionals to handle and respond to this problem correctly and hand down a correct judgment.

#### First Viewpoint

Japan started running the government-managed nursing care insurance system on April 1, 2000, following the parliamentary passage of relevant bills.

Under the system, half of overall annual expenditure for nursing-care services for the aged has to be shouldered by the government under the insurance system with the remaining half matched by taxpayers in the form of their monthly premium payments into the national coffer and additional types of payments out of family budgets for services offered at geriatric health facilities such as food and diapers.

Such overall expenditures for nursing-care services are expected to come to 11.08 trillion yen in fiscal 2018, more than triple the 3.6 trillion yen spent in fiscal 2000.

Geriatric health service institutions, called a Roken in Japan, and specific nursing homes for the aged, called a Tokuyo, have been two major institutions whose resident-patients live collectively and benefit from the government-managed nursing care insurance system. A survey in 2012 found that there were 3,710 Rokens that were taking care of a combined 331,916 resident-patients, whereas a total of 6,092 Tokuyos were providing nursing-care services to a combined 439,148 residents. These numbers have remained at almost same levels since then until today.

These residents are recognized by local governments as being qualified to receive nursing-care services at these collective-residential facilities under a health-level grading system designed to assess how seriously they have come to need nursing care by government-certified nursing care service providers. The debilitated elderly is assigned either one of grades ranging from 1 to 5, depending on how greatly they need to depend on nursing care. The larger the grade numbers, the more serious their health levels are as a result of seniority-associated physical decays.

Separately from some 770,000 beneficiaries of nursing care services at these two types of nursing-care residential facilities, Japan now has a cohort of 3.82 million elderly who have been assigned either one of the five grades and still live at their homes, while receiving nursing care services by certified care providers who pay visits to them at their homes.

In addition to these combined 4.59 million elderly assigned one of the five grades, Japan has a massive cohort of elderly aged 65 or over whose health levels have not yet deteriorated to the levels requiring an assignment of grades. This cohort, which will eventually become the beneficiaries of the grading system and the nursing care insurance system, numbers 28.49 million. The government expects these healthier old persons to start putting heavy strains on the national coffer, when they start receiving services under the nursing-care services either at collective-residential facilities or at home.

Tokuyo is a collective residential home whose services specialize in nursing care for the aged, as its name signifies. (Toku signifies being specific, as this

category of homes concentrates on providing nursing care. Yo means nursing care). Tokuyo is short for Tokubetsu Yogo Rojin Home (literally translated as The Elderly's Home specializing in the Provision of Nursing Care). Whenever patients at a Tokuyo becomes ill, a Tokuyo staff has to transport them to the nearest hospital or hospital with special business ties with them due to the absence of a doctor at the Tokuyo facility itself.

Costs of medical services provided by such hospitals to the old patients brought in by a Tokuyo staff are covered by the government-managed national medical insurance system for which the patients paid premiums for decades of his or her working years, because hospitals are staffed by a doctor with a legal authority to write a prescription for medicines whose costs are covered by the national health insurance system. But a Tokuyo itself is neither allowed nor required by laws to have a doctor stationed at its facility or hire a doctor as its supervisor qualified to issue medical instructions to its staff.

On the other hand, a Roken (short for a Kaigo Rojin Hoken Shisetsu) , -- whose name (literally translated as "The Elderly's Residential Facility that Provides Nursing-Care and Health Maintenance Services") suggests that the facility is an institution that provides the elderly with a wider range of health services encompassing medical and nursing-care services than a Tokuyo -- is a unique facility which was institutionalized by the government to provide such people with higher-quality medical services, while limiting relevant government expenditures to cut national health costs relating to the elderly.

Laws do not obligate the government to pay for medical services which a Roken may provide -- such as medicines, intravenous drips, diagnostic services and vital nursing-care services like the removal of foreign material like food particles from patients' laryngopharynx, oropharynx and peripharyngeal space with a suction catheter called the Nelaton catheter -- from its national health insurance system account.

Still, a Roken provides better medical and nursing-care services than a Tokuyo, because relevant laws and the health ministry's ordinances both require and authorize a Roken to hire and have a doctor stationed at the venue or have a doctor supervise its staffer by giving appropriate medical instructions, thereby

freeing a Roken from the complications of having to transport its old resident-patients to nearby hospitals whenever their health conditions deteriorate seriously.

But a Roken has a demerit of its own, in that the same laws and ordinances do not authorize it to ask the government to pay for medical services it provided to its old resident-patients by invoking the government-managed national health insurance system.

As a result, a Roken is required to pay for all such medical services out of its own pocket, be the services provided medicines, intravenous drips or a removal of foreign substance like food or saliva from patients' laryngopharynx or airways with the Nelaton catheter. Even if a Roken transports patients to the out-patient sections of its nearby hospitals, transportation and personnel costs incurred in the transportation process are not covered by the national health insurance system, forcing the Roken to dig into its pocket.

Article 15 of the health ministry's ordinance -- issued on March 31, 1999 -- mandates that a doctor at a Roken examine patients, administer medicines or injections and provide medical treatments to resident-patients in an appropriate manner in view of the patients' conditions. But the laws and ordinances do not specify what sorts of medical treatments, medicines and diagnostic procedures services Roken doctors should use and provide.

Article 16 of the same ordinance, meanwhile, stipulates that a Roken doctor "must take steps to send its resident-patients to a hospital that has been cooperating with the Roken in cases where the doctor judged that it is difficult to provide, on its own, the levels of medical services deemed necessary to handle the conditions of the residents."

Apart from the above-mentioned articles, Provision 4 of the ministry's ordinance No. 59 -- issued on March 31, 2000 -- stipulates that a Roken doctor must "provide the types of medical treatments and services which the doctor can provide" on the basis of his or her medical skills and knowledge, while stipulating that the Roken "is not authorized to ask the government to pay for the costs of such medical services and treatments by invoking the national health insurance system." This clause presents a serious moral problem and irritable chronic headache to Roken doctors.

Article 2 of the Nursing Care Insurance Law mandates that a Roken facility must have at least one doctor for every 100 resident-patients, while Article 15 of the 1999 ordinance issued to facilitate the law's enforcement stipulates that such a Roken doctor must provide "appropriate medical services" with regards to resident-patients' diseases or injuries "for which the doctor deems necessary to provide certain medical treatments" on the basis of an appropriate diagnosis.

In other words, laws authorize a Roken to have a doctor. But the same laws do not authorize the doctor to invoke the national health insurance system and ask for payments from the national coffers for the medicines which he or she may prescribe in view of the health conditions of the patients.

Suppose that a resident-patient at a Roken or his or her family developed a strong desire to have the government cover his or her medical costs under the national health insurance system. In such an eventuality, the patient or its family would firstly have to ask the Roken to discharge him. Then, the patient would have to move to a hospital, a Tokuyo or other types of privately-run nursing-care homes for the elderly – often more expensive than a Tokuyo and a Roken -- before becoming qualified to benefit from coverage under the national health system.

This system has put both Roken managers and doctors across the nation in a serious dilemma of both moral and business natures.

Urged by their sense of mission as a professional doctor responsible for the health and life of ailing old fellow humans placed under their care, the doctors at Rokens would naturally want to provide as high medical services as possible, including a prescription of expensive medicines they deem necessary and useful to accomplish the patients' cure, and even would want to install expensive diagnostic equipment like a 4 million-yen X-ray imaging machine and the hiring and stationing of radiographers who costs 5.3 million yen per such X-ray technician at their facilities, if only they were allowed to do so by their facilities' business managers, while the same doctors are well aware that they cannot force the managers to pay for such expensive treatments and equipment to avoid plunging their facilities' business operations under a breakeven point and avoid

causing their facilities to lose profitability to the point of forcing their facilities to go bankrupt.

### Second Viewpoint

As a second crucial viewpoint, we now have to take into accounts the fact that the health ministry has been taking a multiple of measures for years to curb burgeoning expenditures from the national treasury for both the government-managed national health and nursing-care insurance systems for both the elderly and people at younger age brackets.

Now, let's take a look at a good example of a cutback in 2014 of fees which the government pays for each installation of a percutaneous endoscopic gastrostomy (PEG) at the elderly who became unable to eat any more.

Under the nation's government-managed insurance system, hospitals are paid for various types of medical services and treatments they provided to patients by filing "statements of medical fees" called the "Receipt" which derived from the German word "Rezept" etymologically.

To cite an example, the government in 2014 lowered a treatment fee for a PEG installation by lowering "points" it assigns to such treatment under the point-based payment system with which fees of various medical services administered are paid to hospitals by converting points amassed through the administration of medical treatments to patients into their corresponding cash values.

In implementing the 2014 revision, the government slashed the point for each PEG whose remuneration payments hospitals are authorized to seek by entering points representing the treatment on their statements of medical fees indirectly to the government.

In the revision, points for a PEG installation was curtailed to 6,070 points from the previous 10,700 points. Since one point represents 10 yen, the cutback means that doctors are now allowed to seek 60,700 yen for each PEG installation, down from the previous 107,000 yen

A PEG installation used to be a procedure classified into a category of emergency medical treatments in view of the serious nature of the surgical operation. In recent years, a growing number of hospitals and geriatric health-care facilities have come to conduct PEG operations frequently in cases where old resident-patients under their care become unable to eat by themselves any longer, partly because it is much easier to feed patients through gastrostomic tubes than in cases where hospitals instruct their health workers to feed the debilitated patients with physical handicaps by handling a spoon, a labor-intensive process which requires such workers to spend a long span of time lasting more than 30 minutes per meal in addition to toils and human energy required.

The original pre-cutback lucrative point of 10,700 points for each PEG and medical institutions' desire to free their nurses from time-consuming and energy-intensive feeding labor have induced an upsurge in both the frequency of PEG operations and resultant national health insurance costs.

In addition to these factors, doctors are aware that a PEG installation would enable patients to live much longer than in cases where they forgo a PEG installation and thereby give hospitals the attractive prospect that they would be able to continue to secure a stable source of income from the presence of such patients at their hospitals in view of lucrative fees payable under the government-managed nursing-care and medical insurance systems. The upsurge in the number of PEGs has also put additional strains on the national budget for the government-managed medical insurance and nursing-care insurance-associated expenditures.

Summing up, steps implemented under the 2014 revision were as follows:

- 1) A cut in a PEG fee from 10,700 points to 6,070 points and the imposition of stiffer conditions and requirements that should be observed by medical and nursing-care service providers intent on conducting such PEG surgeries. The tougher requirements themselves were aimed at dissuading hospitals from conducting PEG operations in an easygoing business-minded attitude.



\* Under the revision, medical Institutions, which stand ready to perform a gastrostomy, were required to live up to following requirements, starting in 2014;

- (1) The annual number of PEG installation were limited in principle to less than 50 per medical institution or nursing-care facility.  
If a medical institution or nursing-care facility still wants to conduct PEG operations whose frequency tops 50 per year,
  - (a) the institution must evaluate the degrees of a patient's swallowing function prior to a PEG.
  - (b) Such institution must ensure that at least 35% of patients who received a PEG at their institution or those who have been receiving nutrition via nasal tubes will recover their physical ability to take foods orally.
- 2) As a newly instituted incentive system to encourage such an assessment and a PEG closure, the government pledged to assign 2,500 points for each case of patient whose swallowing function was assessed by a medical institution. In addition, the government promised to assign 12,040 points for each case of a surgical operation at which a PEG is closed.

These revisions were introduced due to the government's decision to seek to cut back on the number of PEG operations and limit payments under the government-managed national insurance system.

### Third Viewpoint

Pneumonia is one of life-threatening diseases that have stricken Japanese disregards of their age groups. But this disease has turned out to be the most dangerous life-threatening disease for very old Japanese people in recent years.

The Japanese Respiratory Society, a grouping of respiratory organ-related disease specialists, issued a set of guidelines on how doctors should handle cases of the Community Acquired Pneumonia (CAP) for the first time in 2000. Two years later, the society issued a separate set of guidelines on how doctors should respond to cases of the Hospital Acquired Pneumonia (HAP). <sup>6,7)</sup>

Those two sets of guidelines, however, did not provide any treatment standards or norms on rampant cases of pneumonia at the elderly, although providing such standards for the elderly's pneumonia had already become the most important and pressing task in view of the fact that the infectious disease oftentimes pounds out the elderly repeatedly, leading such patients to contract pneumonia repeatedly after their complete cures or remissions until they expire and breathe their last.

Pneumonia at the elderly turns out to be the most life-threatening, compared with various pneumonia cases that attack the Japanese of multiple or younger age groups. In Japan, a large number of the elderly have come to reside together under the same roofs of some 10,000 nursing and health-care-providing institutions such as Rokens or Tokuyos. These old persons are the very persons who need nursing care due to their very frail health conditions. In addition to the fact, they are often the sufferers of various other diseases, such as hypertension, hemiplegia, diabetes, cardiac diseases, chronic pulmonary diseases such as interstitial pneumonia, lung fibrosis and dementia.

The state of pneumonia at such old people sharply differs from that of the Community Acquired Pneumonia (CAP) which young healthier people also contract. The reality had spawned an acute necessity of compiling a set of guidelines for pneumonia at the elderly against the backdrop of the rapidly graying of the Japanese populace and the skyrocketing number of cases of pneumonia at the elderly.

In December, 2017, the Japan Medical Journal, a prestigious medical journal, published a summary of the much-needed fresh guidelines for the "Nursing and HealthCare-Associated Pneumonia (NHCAP)" compiled by the Japanese Respiratory Society. (Figure 6) This guideline clearly says that doctors may adopt medical treatment strategies that differ from their strategies for CAP cases to patients of NHCAP and Hospital-Acquired Pneumonia, while explaining reasons on why such different strategies and approaches are acceptable, necessary and may be actively recommendable.

The 2017 guidelines for NHCAP say that such nursing and health-care

facilities may refrain from providing active medical treatments like the adoption of what the association calls a “de-escalation strategy” in selecting antibiotics for patients – the strategy of selecting narrow-spectrum strong antibiotics that doctors judged would specifically suppress and eliminate the bacteria causing the type of pneumonia now tormenting their patients – in responding to pneumonia cases of old debilitated patients who are staying at their facilities– especially those at the terminal stage of their life -- because such resident-patients present a high risk of contracting pneumonia repeatedly even after the administration of such antibiotics and because their quality of life and their activities of daily activities are unlikely to be improved by such active medical treatments and because a life prognosis for their fundamental lasting recovery of health cannot be deemed realistic.

The guideline firstly provides four definitions of NHCAP with the first and most important being “the type of pneumonia that hits resident-patients who have been admitted to, and stay at, facilities with beds for long-term medical care purposes or now stay at nursing-care facilities.”

Let us quote some of vital paragraphs of analytical insight which the society’s specialists have drawn up after careful considerations from the society’s 2017 guidelines as follows;

“Both HAP and NHCAP cases provide higher mortality rates and higher probability of the types of bacteria resistant to antibiotics being identified through an examination than CAP cases ... Many of NHCAP cases stem from aspiration pneumonia that have been contracted by the elderly.”

“Although NHCAP symptoms include fever, cough, sputum and dyspnea, we need to keep in mind that at NHCAP cases, most of which hammer out the elderly, symptoms tend to be limited to those atypical of bronchopulmonary symptoms, namely, anorexia, incontinence and decreases in the activities of daily life.”

“We need to keep in mind that applying antibiotics deemed appropriate to cure HAP/NHCAP cases does not necessarily improve their prognosis because HAP/NHCAP sometimes induce the conditions of pneumonia at terminal-stage patients or oftentimes show up at patients who are going through the process of

their aging. Therefore, the issue of whether patients are affected by antibiotics-resistant bacteria and the classification of degrees of the seriousness of patients' pneumonia do not necessarily provide a barometer useful for the selection of antibiotics, so we need to adopt a treatment strategy by taking into accounts the state of patients. In other words, we need to take into considerations a phase of life-ethics under which preventing a fall in the patients' quality of life should be given a priority in judging whether it is necessary nor not to apply active treatments such as intensive care and a hospitalization."

"NHCAP is a concept of pneumonia and is a definition of pneumonia cases which show high levels of singularity of the Japanese situation that mirrors the situation characteristics of Japan. NHCAP take place at patients who are hospitalized or now are staying at nursing-care facilities. Many of NHCAP cases manifest themselves as cases of aspiration pneumonia stemming from falls in the patients' functions of swallowing...NHCAP can take place as a result of opportunistic infections. The frequency of the breakout of NHCAP cases are expected to continue to grow in the coming years amid the progress in the graying of the Japanese populace and in line with increases in practices of medical interventions."

"There is a close relationship between the infirmity of old age and pneumonia breaking out, so there are cases where patients develop aspiration pneumonia in the process of becoming decrepit and senile. In cases where congestion or death rattle took place, it becomes difficult to distinguish these manifestations from pneumonia."

"In cases where patients develop pneumonia as a complication in the process of becoming infirm with age and in cases where the very pneumonia thus contracted deals a finishing blow to the patients, it is common to interpret such cases as pneumonia that occurred as a mere immediate cause of their deaths although the very infirmity of old age should be deemed the underlying more important cause, just as in the cases where patients die of pneumonia when their cancers worked as the more important underlying factor, so there have been reports that some clinicians have interpreted relevant cases as such."

"Aspiration pneumonia is the pneumonia that breaks out as a result of

damages to patients' swallowing functions after such patients' activities of daily life and overall bodily functions have deteriorated and especially after the patients have been affected by problems at his or her brain blood vessels."

"Treating a cancer patients' pneumonia when the patient is already going through his or her terminal stage due to cancer or when patients are at the closing phase of his or her life as a result of senility-associated physical decay does not necessarily improve the quality of life at such patients. Therefore, doctors are advised to hand down a correct judgment on how he or she should treat the patients' pneumonia in addition to providing pain-softening treatments for alleviating pains in selecting treatment methods for such patients."

"Considering taking active treatment policies for HAP/NHCAP patients does not necessarily help improve a life-prognosis and the quality of life at such patients. This guideline has proposed that doctors take into accounts, first of all, a life ethics-related phase of this issue such as deciding a treatment policy after respecting the wills of patients and his or her family members in cases where the patient's doctor judged that the patient developed pneumonia as a result of senility-associated physical decay or in cases where patients have the risk of developing aspiration pneumonia because he or she is going through the terminal stage of his or her life."

"Some doctors have expressed the view that it is unnecessary to adopt a treatment strategy aimed at suppressing bacteria that have developed resistance to antibiotics in cases where the patients' activities of daily life are gradually falling and such patients are showing the manifestation of being at the terminal stage of life, so it may be adequate for us to take an escalation strategy in cases where patients are suffering from aspiration pneumonia or are presenting a risk of developing aspiration pneumonia."

Let us call readers' attention to a paragraph in the guidelines' Page 41-42 in which the guideline underscores major difference between CAP and NHCAP by firstly defining CAP as cases at which it is possible to completely cure their patients by administering appropriate antibiotics and at which patients would be able to recover to his or her pre-CAP contraction physical conditions without leaving serious after-effects to them once the disease is cured.

In contract, the guideline says that “NHCAP are oftentimes pneumonia that broke out at patients who are following an irrevocable process heading for their death, including persons who are at the terminal stage of cancers or persons at who the process of seniority-associated physical decay is under way. NHCAP cases can act as a trigger that brings deaths to their patients. NHCAP cases are those of patients who would not be able to return to their pre-NHCAP contraction physical conditions even if their physical conditions may improve somewhat as a result of active medical treatment, while being the cases where unbearable pains or a sense of unpleasantness may hound the patients even after a fractional recovery in their health conditions and at which such pains and sense of unpleasantness may start afflicting such patients down the track.”

In view of the reality, authors of the society’s 2017 guideline said in Page 42 that they have decided to recommend a new approach to NHCAP by distinguishing pneumonia at which medical treatments can return their recipients to pre-pneumonia conditions from serious NHCAP cases at patients who are mired at the terminal stage of life or who are suffering from pneumonia that helps speed up the patients’ process heading for their deaths amidst the process of proceeding seniority.

The guideline noted that NHCAP and HAP cases include cases of those who are approaching death as a result of the disease and cases of those who are at the terminal stage, including cases at which patients reached such stage as a result of the progress of their seniority-associated physical decay.

In the paragraph in Page 42 that carries the subtitle, “Various Japanese Guidelines that Provide the Rationale for Refraining from Providing Strong Treatment to Pneumonia Patients,” the society’s 2017 guidelines call doctors’ attention to one of such guidelines issued in 2007 by the MHLW, which is entitled, “The Guideline Concerning the Process of Deciding Medical Treatments for Patients who are at the Terminal Stage of Life.”

## 6. Conclusion

The emergence of the gigantic demographic group of people aged 65 years or over, whose situation in Japan we have examined in this dissertation,

has not been observed not only in Japan but also in any other country in the history of the mankind. After conducting a careful analysis, it now appears appropriate for us to conclude that pneumonia at the elderly which we have considered under the category name of the Nursing and Health-Care Associated Pneumonia should be considered and treated with medical standards that are different from those for cases of the Community Acquired Pneumonia which can affect people at younger age brackets in addition to the elderly who live and stay out of nursing-care facilities.

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