Development of Tsutsui Total Care Code: revealing the nature and quantity of care services provided in Japan Fields of nursing care, long-term care, and care services for children

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目的：本稿では、これまでほとんど言及されてこなかった介護保険制度の導入に際して本格的に開発がすすめられたT.C.C（Tsutsui total Care Code）とこれを用いて実施された介護職員の業務量を測定した手法である他計式１分間タイムスタディ調査法をなぜ日本が選択したかについて論じる。
方法：採用された調査手法の特徴を明らかにするために、Work-Sampling(ワークサンプリング法)やTime-and-Motion(時間動作法)という業務を測定する伝統的な2つの測定方法との比較を行い、共通点と差異点を明らかにする。また、介護・看護・養護・保育領域の対人援助サービス領域において、この手法によって収集されたデータを数量化し、分析する際のツールとして、独自に開発されてきたT.C.C.のこれまでの開発経緯と開発されてきたコードに関わる研究をすべてレビューした。
結果：日本は、徴収する税・社会保険料拠出の全体規模が他の先進諸国に比較して相対的に低い中で介護や看護、社会的養護、社会的養護、保育等の対人援助サービスにどれだけのコストを支出するかは大きな課題である。この課題の解決のために対人援助サービスの内容を網羅したコードの改定が24年間にわたって実施され、多くの領域で利用されている実態を明らかにした。
結論：日本は、社会保険制度の仕組みを通じて、医療や介護費用を一定程度まで確保することに成功したが、昨今、介護に携わる職員の給与は低いことが問題とされ、このことは、すなわち、対人援助サービスにおける価格設定に対する不信として現れている。本稿では、これらのサービスの多くが抽象化されていることに対する問題を指摘し、これを明示化するために、T.C.C.が有用であることを示唆した。今後、日本では人口の高齢化に伴う増大する介護のニーズに見合った介護支出を公的に確保していく上では、いかに合理的な価格設定をしたかの根拠を求められる。本研究で示した知見は、今後の新たな対人援助サービスを担う人材に対する所得保障の在り方を検討する際の基礎的知識として重要と考える。

キーワード：T.C.C（Tsutsui total Care Code）、他計式１分間タイムスタディ調査法、対人援助サービス、ワークサンプリング法および時間動作法、コード化

1．Introduction

Many studies for the creation of labor standards in the field of nursing care services or to determine the relative value of medical care provided by physicians have been conducted since 1950, as well as surveys on the way care staff, such as physical therapists, distribute their time on care activities[1)-5)]. The origin of these studies measuring a quantity of work and

aiming at a more rational and productive way to work can be traced to Taylor's research in the managerial field[6]. Taylor was the first to use a stopwatch to measure the time that factory workers would spend on a task, leading to what can be called the earliest surveys in industrial engineering. In these surveys, two main ways of measuring work tasks can be distinguished: the work sampling method and the time-and-motion method.

Meanwhile, for the establishment of the Long-Term Care Insurance System in Japan, a computer-based "system of care-needs certification" was designed to categorize the care needs of elderly persons based on the actual time spent by staff members on providing care[7]. To design such a system, many studies, using the two methods stated above, were conducted in various care facilities to measure the work done by care staff[8]. Since then, these methods have gathered interest in the fields of healthcare and welfare and especially in long-term care studies conducted in the late 1990 s[9)-12)]. However, most of these studies had a limited sample size[13)] or chose the work sampling method without examining sufficiently the precision level of the data collected[14)] and the way to codify care tasks.

In the field of nursing care, studies[15)-19)] aiming to quantify the amount of care work have succeeded in developing the "Nursing-care Needs Level" system, a tool designed to assess the condition of patients based on the time actually spent on providing care. This tool is still currently used as an indicator to determine the remuneration of medical services covered by medical insurance. This tool is not only used to assess objectively the quantity of nursing care resources needed by medical institutions. It is also used in longitudinal studies aiming for a personnel distribution more appropriate to the care needs of patients, and it has contributed to the standardization of care in clinical practice[20)-23)].

Similar studies were conducted in 2008 in another field of social care: care services for children. Results already obtained in the fields of nursing care and long-term care were used to create an evaluation scale of "Care Needs Level for Children" to assess the care needs of children with emotional or behavioral disorders[24].

In the field of social care, debates and studies about the implementation of an evidence-based care provision system occurred quite late in Japan. A comparison with the field of healthcare suggests that most researchers started to show interest in quantifying care services for children only after the implementation of the Long-Term Care Insurance System. The goals of these studies go from a rough understanding of the content of daily care to the examination of factors influencing the nature and time of care activities[25)-28)].

However, even when a study chooses as an objective to examine exhaustively the time needed for care tasks provided in associations and institutions, the study may end with a simple individual analysis of the time spent by the constituent members of the institution. In the end, the method used in the study and the results could not be generalized and failed to lead to any concrete political measure.

Conducting a close investigation is crucial when trying to reveal the quantity of care services provided. However, until recently, the collection of data and the studies themselves were limited because of the additional burden they put on an already hectic work place. Most of the studies mentioned above were conducted in only a single facility, and none of them exceeded

six facilities. With such a limited sample, the collection of unbiased and reliable data seems compromised. For example, there might be implicit knowledge that a more serious medical condition leads to more treatment or that elderly persons with dementia need more care than non-demented ones. However, testing the validity and finding any evidence to confirm or disprove this knowledge would require a considerable amount of data about the clinical condition of the elderly persons and the services provided.

Nevertheless, these studies measuring the quantity of care work form the background to the development of the Tsutsui Total Care Code (T.C.C). With this in mind, the first part of this paper will present the research that actually led to the formulation of the Japanese policy: a one-minute time-and-motion study. This study measured the quantity of care tasks provided by various employees in the fields of healthcare and social care and collected data in sufficient quantities.

The Japanese method of measuring the quantity of care provided will also be compared with the two main conventional methods inspired from managerial studies: the work sampling method and the time-and-motion study. This may also enable a better understanding of the way data influences the management of the care-needs certification system and the way data are used to design the remuneration system of care services. This may lead to a better recognition of the importance of these data.

The second part of this paper will present the development process of the T.C.C, a tool unique to Japan and used to analyze and quantify the data collected in the fields of nursing care, long-term care, and care services for children through the method mentioned above.

2. Characteristics of one-minute time-and-motion study conducted in Japan

1) Time-and-motion method and work sampling method

Taylor's method for measuring a quantity of work is based on three main phases: 1) isolate accomplished workers and observe precisely the sequence of their actions, 2) measure the time needed to accomplish each and every one of these actions, and 3) after suppressing the unnecessary actions, clarify the best and fastest actions and equipment to use. The goal was to determine and implement a standard quantity of work for every worker in a factory and the time needed to accomplish it. This could only be achieved by measuring the time based on the fastest and best workers and by employing accomplished workers and making them work at full speed[29].

A more precise method using a stopwatch and time-lapse photography was designed by Gilbreth in the early 1900 s. The goal was to establish a unique and optimal way to work by following the "principle of motion economy[30]". In 1930, followers of Gilbreth, such as Mogensen, stated that finding the time needed for a task first required knowing the optimal way to accomplish that task. This process started with motion studies and was followed by time measurement studies. It then became commonly known as time-and-motion studies[30].

The best way to decide whether a time study or a motion study should be conducted is to look at the type of work concerned in the study. Basically, if the study concerns a type of cyclic

factory work, repeated in a short time period, a motion study would be appropriate. However, if the work concerns care between people in the framework of medical insurance and social welfare, as is the case in our study, then achieving standardization of care through a simple improvement of actions would be impossible in practice. This is because the diversity of care and care provision would have to be considered in finding the best way to accomplish a task. The standardization of time and quantification of tasks accomplished by Taylor's time studies and the standardization and simplification of tasks achieved through Gilbreth's motion studies are considered cornerstones of business administration. However, the procedure of analyzing the situation, and then identifying and resolving issues, which is at the base of every time-and-motion study, would now take an incredible amount of time. Applying it in our era ruled by quickly delivered and widely diversified small quantities of products would be difficult.

If this method were to be applied nowadays in the fields of healthcare and social care, the same issues regarding the high diversity of services and the multiplicity of users would have to be faced. These issues led to new motion studies, which were conducted based on the same analytical method but were more practical, focused on the field site, and less time-consuming. Meanwhile, increasingly fewer time studies on business administration were being conducted[31].

Time-and-motion studies are based on a resource-consuming method of collecting information about the time spent on work tasks through observation of each worker by a single assessor. This assessor conducts the survey by continuously following the subject during a prolonged period of time. Because of the need to record all actives and their respective durations; this method has been considered time- and resource-consuming and thus led to another system: the work sampling method.

Observations in the work sampling method can be either random or decided at fixed intervals. Usually, the time spent on each activity is then deduced from the quantitative percentage of the activity. Data are collected by observing what the worker is doing, with a certain amount of time between each observation. Workers are sometimes observed at a pre-established point in time. In some studies, the observations are self-reported, i.e., the worker records his or her own activities in a diary.

2）Respective limits and merits of work sampling and time-and-motion studies

Work sampling studies based on a caregiver's self-reports are subject to the risk that information regarding the activity is not recorded precisely, in a timely manner, completely, and truthfully. For this reason, these studies are said to have low reliability[13].

Work sampling using one or more external assessors to observe multiple participants is the most common method when the study concerns workers restricted to a designated area, such as nurses in a hospital ward, workers in a factory, or pharmacists in a pharmacy. However, if the workers are not restricted to a given area, such as residents making rounds in the entire hospital, then the time-and-motion approach consisting of one observer for one participant seems the most appropriate.

Regardless, this does not change the fact that in both work sampling and time-and-motion

studies, there is a risk that the care service provider, knowing he or she is being observed, will change his or her usual behavior, resulting in a misleading picture of the real situation. This risk is particularly high with time-and-motion studies where the worker is constantly followed by an observer and thus is more likely to drastically change his or her daily behavior. For caregivers in particular, forgetting the presence of the observer seems very unlikely. However, if the observers stay at a considerable distance from the worker, the range of tasks that they will be able to observe will be limited. Comparatively, a work sampling study with only one observer for one floor will maintain a certain distance from the caregiver, and the observer will blend in more easily, leading probably to a weaker impact on the way the caregiver behaves.

To reduce the influence of the observer on the caregiver when using a time-and-motion method, video recording could be used but, especially in nursing homes and hospitals, the range of activities is so vast and the caregivers so mobile that this solution seems unrealistic. First, a significant number of cameras would have to be placed to cover all the areas the caregiver was likely to access. In addition, the task of identifying and measuring specific actions conducted over a long time in video recordings seems excessively arduous. Such a method would also raise another issue regarding the task of separating private conversations from work-related ones, possibly leading to misinterpretation concerning the classification of activities.

The last issue concerns the cost of the study. A work sampling study can be conducted with only a few observers, which makes it cheaper than a time-and-motion study. Time-and-motion studies are more expensive as they aim at continuous observation of the situation, requiring an observer for each caregiver. This explains why most previous studies using this method had to significantly restrict the number of observed workers.

As an example, one time-and-motion study collected 13,000 minutes of data by following only 8 residents[30]. In this case, the number of residents is obviously too small to be representative of the entire population. According to Brisley[32], if the activity conducted by the worker occupies 50% of the total time, then a precision level of 10% (50%, ±5%) can be obtained with 400 observations. However, if the study aims at a 1% precision level (50%, ±0.5%), then 40,000 observations would be needed. From these estimations, the difficulty of conducting time-and-motion studies on a large scale can easily be deduced.

Other examples are two studies: one conducted by Gillanders and Heiman[33] of 6 interns over 5 days, where all the intern activities were recorded, and the other conducted by the National Center for Health Services Research (NCHRS) to assess the resources needed in nursing homes[31]. Both these studies suggested that increasing the data points in a work sampling method was still cheaper than conducting a time-and-motion study.

Overall, information collected using a time-and-motion method will be of better quality, but there is a risk that the low quantity of information collected will hinder the generalization of the behavior observed.

Taking into consideration these previous studies, the Japanese government chose to raise national funds to conduct a large-scale time-and-motion study to investigate the amount of work

done in nursing care facilities. The facilities where the study was conducted were recognized as high-quality care providers before the implementation of the Long-Term Care Insurance System.

The first two phases of Taylor's method were followed in this study: 1) isolate accomplished workers and observe precisely the sequence of their actions and 2) measure the time needed to accomplish each and every one of these actions. The goal of this government study was to determine a reliable standard time for each task and a reliable standard quantity of work done in the nursing facilities of Japan, without being restrained by expense issues.

To establish the Long-Term Care Insurance System, the Japanese government launched the "Research project on the provision of health care and social services" as part of the Ministry of Health's promotion of health for elderly persons in 1994. This research was a one-minute time-and-motion study conducted at a scale never before seen in any developed Western country. It concerned elder care facilities (with inpatient management fees in category I), long-term care health facilities (with patients under category II care fees), and special nursing homes for the elderly; it followed a total of 2,376 employees and was conducted over 2 entire days. Another one-minute time-and-motion study was conducted of 500 home helpers and 300 home-care nurses. The time spent on care activities in the fields of medical and social care for elderly persons was measured using the same time-and-motion method. These assessment data were then expressed in the form of T.C.C and led to the quantification of activities by revealing the average time, the standard deviation, and the intermediate value of each care code.

3) Creation of an assessment tool for identifying and quantifying services provided by care staff

1) Background of the creation of care codes

To conduct this one-minute time-and-motion study, a tool that could describe the care provision system as it was in Japan was necessary. The content of care services had to be clarified before they could be measured.

The care provided to elderly persons by family, various caregivers, and nurses has been and is still being described in terms such as "care of Mister X," "personal care," "bathing services," and "psychological support" since the 1990 s. However, even for a term seemingly as simple as "bathing services," classification of it into one of the categories depicted in Table 1 can be difficult and depends highly on the knowledge of the caregiver.

The T.C.C was developed to reduce the impact of implicit knowledge. With the T.C.C, even an unspecialized observer could accurately depict the nature of the care provided through each activity. Thus, it became possible to depict an activity, e.g., "bathing services," as a combination of care codes.

The development of T.C.C began in 1987 with the classification of handicapped children's demand behavior for their mothers. However, the first utilization of T.C.C in the geriatric field was made in 1990 s) with the original goal of determining whether the provision of a certain care service was needed. The creation of T.C.C followed two of Taylor's phases: measure the time needed to accomplish each and every one of the actions, and after suppressing the

unnecessary actions, clarify the best and fastest actions and equipment to use, with the ultimate goal of finding the appropriate care that should be provided.
Long-term-care manuals at that time exhaustively described techniques to help with, for example, postural changes, walking, or holding elderly persons in a comfortable way. However, adjustments regarding the type of elderly person, and the type and quantity of care were almost completely absent. Very few studies focused on the adequate quantity of care that should be provided, and this remains true even now.
In the literature and practical guides, the method used to examine whether the services provided are appropriate to the elderly person consisted of evaluation of the elderly person's capability and functional level by professionals, followed by a needs assessment.
In other words, the research used to stop after the situation was graded and the elderly person's activities of daily living (ADL) score, i.e., the presence or absence of problematic behavior and the person's mental and functional level, was assessed. However, studies examining the actual quantity and content of care provided according to this grade and classification are almost nonexistent in Japan.
In addition, the apprenticeship system, which is the standard in the field of long-term care in Japan, has had an effect. This system consists of first observing more experienced staff to learn the content of care to provide and then repeating the action for an elderly person in a similar condition. This system leads to an empirical transmission of care techniques and knowledge about the content of care. However, this transmission has never been structured or systemized.

2) Isolating various daily care activities and unitization
Until recently, the nature of the care activities, e.g., the first and last activities of bathing services, for elderly persons ware not formally defined.
As shown in table 1, "bathing services" for elderly persons actually suggests the provision of numerous care activities. The starting point of bathing services is to communicate to make sure that the elderly person is ready to take a bath by asking, for example, "Would you like to have a bath now?"
This care cannot be provided without "Earning the consent of the service user before beginning bathing services" (**Care code 142**), whatever his or her condition. After consent is obtained, the type of care varies according to the condition and the environment of the elderly person (service user). For example, the user may try to move to the bathroom without help (**Care code 117**), and even in this case, the caregivers may "Escort" the user (**Care code 118**), which leads to other patterns such as "Assistance with a wheelchair" (**Care code 119**) or "Use of a stretcher" (**Care code 121**). In addition, before going to the bathroom, a "Transfer from the bed" (**Care code 108,110**) may occur. The content of care can further vary if the bathroom is on the same floor or on a different floor. If the patient is confined to a bed, then a various range of activities, such as "Sitting up in bed", or eventually when leaving the bed, "Providing support for the body" (**Care code 105**), may occur. Users in wheelchairs may also be able to move without help. Before entering the bath, some users will need "Help to take off clothes" (**Care code 49–53**)

. Moreover, after the bath, it may be necessary to "Apply topical medication" (**Care code 234**) for users with bedsores.

The complexity of bathing services is such that, in institutions, the procedure is almost never done by a single employee but by multiple caregivers. Bathing services are an aggregation of multiple care activities, and thus, as also in the case for "Meals" and "Toileting," using a care code for each of these activities enables unitization or visualization of an abstract care service into a combination of concrete activities that also enables quantification of these activities.

Measuring every activity suggests placing a numeric value on objects and events in a standardized way. However, with abstract expressions such as "Toileting assistance" or "Bathing services," which are universally used, the types of activities included in the expression had to be examined. The T.C.C was developed so that the content of these universally used expressions could actually reflect the mental and functional conditions of the persons, as well as the existence or nonexistence of problematic behaviors. More concretely, the creation of T.C.C enabled a numerical conversion of care activities and a unitization of these activities in order to reveal which unit was needed by an elderly person.

To decide which care unit was appropriate for the condition of each elderly person, the government created a committee of various clinical practitioners and opened a fierce and controversial debate. The research committee collected information from countries all over the world about assessment items and care codes. On the basis of this review, physicians, nurses, physical therapists, occupational therapists, and care workers working in elder care facilities, long-term care health facilities, and special nursing homes for the elderly gathered and participated in assessing and developing care codes that could be applied commonly to all these institutions and to home-care providers. Criticism of the creation process of the care codes still exists, but the codes were created based on accurate descriptive data, collected using a time-and-motion method, about the content of care provided by professionals of medical and social care. This is an example, extremely rare in Japan, of sharing human intellect through the process of writing down knowledge, giving form to the knowledge, and sharing the knowledge.

Table 1 T.C.C classification and Care contents in 2008

1 Personal care

Middle classification	Small classification	Care code	Care contents
Personal appearance and hygiene	Face washing	1	Guide patient to bathroom
		2	Give instructions for face washing
		3	Partially assist face washing
		4	Fully assist face washing
		5	Prepare necessary items
		6	Clean up afterwards
	Oral hygiene	7	Oral cleaning (e.g., tooth brushing.)
		8	Gargle
		9	Denture care
		10	Prevent lip dryness and wipe sputum and saliva with tissue paper
		11	Prepare necessary items
		12	Clean up afterwards
	Body hygiene	13	Wipe body parts
		14	Wipe the whole body
		15	Wash hands and feet
		16	Wash genital and anal areas (hip bath)
		17	Wipe with dry cloth
		18	Prepare necessary items
		19	Clean up afterwards
	Hair washing	20	Partially assist hair washing
		21	Fully assist hair washing
		22	Prepare necessary items
		23	Clean up afterwards
	Personal appearance	24	Comb and style hair (preparation and clean-up)
		25	Cut hair (including preparation and clean-up)
		26	Clip nails (including preparation and clean-up)
		27	Shave provide guidance and assistance applying make-up; apply moisturizer after bathing
		28	Clean ears (including preparation and clean-up)
	Showering	29	Prepare necessary items
		30	Clean up afterwards
	Bathing	31	Prepare bathroom and shower stools
		32	Guide patient to tub or lift
	Movement and transfer for bathing	33	Help patient from stretcher to tub lift
		34	Help patient from tub lift to stretcher
		35	Help patient from stretcher to special tub
		36	Help patient from special tub to stretcher and from special tub stretcher to stretcher
		37	Help patient from wheelchair to tub lift or from chair to tub.
		38	Help patient from tub lift to wheelchair or from tub to wheelchair
		39	Help patient from wheelchair to special tub stretcher
		40	Help patient from special tub stretcher to wheelchair
		41	Help patient get in tub
		42	Help patient get out of tub
		43	Move patient by holding, lifting or carrying
	Body washing	44	Partially assist body washing and towel off after bath
		45	Fully assist body washing
	Monitoring	46	Monitor while in the bathroom
	Machine operation	47	Assist transfer using bath lift
	Bathroom preparation	48	Clean bathroom and tub after bathing
Dressing	Clothes changing	49	Prepare clothes (including socks and shoes), hand out towels to bathers, put clothes in hamper, and get towels from wards in preparation for bathing
		50	Monitor and provide instructions for changing clothes
		51	Partially assist changing clothes (including socks and shoes) and change clothes while going to bathroom
		52	Fully assist changing clothes (socks and shoes)
		53	Prepare clothes
Bathroom	Movement and transfer	54	Help patient from wheelchair to toilet
		55	Help patient from bed to portable toilet
		56	Help patient from portable toilet to bed
		57	Help patient from toilet to wheelchair and from wheelchair to portable toilet
	Urination maintenance and recovery Urinary function maintenance and recove	58	Help patient to urinate (excluding changing clothes)
		59	Monitor while urinating
		60	Clean up after urinating
		61	Dispose of urine collection devices
		62	Prepare and dispose of portable toilets
		63	Bladder training preparation, implementation and clean-up, and hand-pressure/tapping urination
		64	Bladder catheter observation, urine volume check/measurement, urine pack (e.g., Uroguard) changing, and urine collection device (Uriserver, Uridome, etc.) changing, preparation and clean-up.
		65	Prepare necessary items

		66	Check urinary frequency, volume and interval
	Bowel movement maintenance and recovery Bowel function maintenance and recovery	67	Help with bowel movements (excluding changing clothes, but including abdominal massage)
		68	Monitor during bowel movements
		69	Stool extraction preparation, implementation and clean-up
		70	Enema preparation, implementation and clean-up
		71	Colostomy care preparation, implementation and clean-up
		72	Prepare necessary items
		73	Clean up after bowel movements
		74	Clean bedpans
		75	Portable toilet preparation and clean-up
	Diapers	76	Remove and change diapers
		77	Inspect diapers
		78	Prepare necessary items for diaper changing; wait for nurse to finish and then change diapers; wait for patient to return to change diapers
		79	Dispose of diapers
Food, nutrition and fluid replacement	Food, nutrition and fluid intake assistance (breakfast, lunch and dinner)	80	Prepare meals (apron, tea, hot water and serving) and confirm the number of tray tags after serving
		81	Monitor while eating
		82	Partially assist eating (cutting into smaller pieces and grounding)
		83	Bring food to the mouth (spoon feeding)
		84	Assist dysphagia patients; assist and provide guidance to patients with hemiplegia or incorrect water swallowing
		85	Clean up after eating; take away trays; clean up after serving tea
		86	Manage food and fluid intake; manage fluid balance; calculate caloric intake
	Snacks and small-portion consumption	87	Prepare snacks and dispose of cold tea before serving hot tea
		88	Bring food to the mouth (full assistance)
		89	Partial assistance
		90	Monitor while eating
		91	Clean up; take away trays; gather and clean personal pots and cups
	Fluids	92	Prepare drinks
		93	Assist drinking
	Therapeutic nutrition and fluid replacement	94	Prepare for oral feeding
		95	Assist oral feeding
		96	Clean up after oral feeding
		97	Prepare for tube feeding (nasal or gastric)
		98	Assist tube feeding
		99	Clean up after tube feeding
Getting up and changing body position	Changing body position and maintenance of proper extremity position	100	Partially assist changing body positions
		101	Fully assist changing body positions
		102	Provide arch support or cushioning using a pillow; prevent sacral bedsores using a special device
		103	Prepare necessary items
		104	Clean up afterwards
	Assist getting up	105	After helping patient to get up, help the patient to walk or move to wheelchair, lay down from side sitting, or lie down
		106	Operate adjustable bed
		107	Help patient get in and out of bed
Transfer	Assist transfer	108	Help patient from bed to wheelchair
		109	Help patient from wheelchair to bed
		110	Help patient from bed to stretcher
		111	Help patient from stretcher to bed
		112	Help patient from wheelchair to floor or mat
		113	Help patient from floor or mat to wheelchair
		114	Operate, prepare and put away wheelchair; rearrange beds in hospital rooms
		115	Help patient from wheelchair to chair
		116	Help patient from chair to wheelchair
Movement (inside facility)	Movement assistance（Assist and monitor while going from changing room to bathroom when taking bath and from hospital room to bathroom)	117	Monitor walking
		118	Assist walking; assist walking with walker; lead guide dog to take elderly patients for a walk
		119	Monitor while in wheelchair
		120	Assist while in wheelchair; prepare and put away ramp (for going out)
		121	Move patients using stretcher

Motor (physical) function maintenance and promotion	Rehabilitation assistance	122	Help getting up and down exercises
		123	Help walking and standing exercises
		124	Help patients to exercise using devices
		125	Assist wearing prosthesis (including monitoring)
		126	Help occupational therapy
		127	Massage and rub
		128	Assist exercise and self-exercise before eating
		129	Help massage therapists
Problem behaviors	Dealing with problem behaviors	130	Deal with/search for wanderering elderly patients
		131	Deal with unsanitary behaviors (including cleaning up unsanitary messes)
		132	Deal with violent behaviors and verbal abuses
		133	Put on and remove restraining bands; lock and unlock restraining jackets
		134	Deal with other problem behaviors
Inspection, observation and measurement	Inspection and observation	135	(Nighttime) inspection and status observation
	Systemic observation and assessment	136	Brain/nervous system (consciousness level); respiration; percutaneous arterial oxygen saturation measurement; circulation; body temperature measurement; digestive tract; skin/wound; extremity and mental state observation; height/body weight measurement; blood pressure measurement
Communication	Help communication	137	Read books and letters to patients
		138	Write letters for patients
		139	Relay messages for patients
		140	Hand out newspapers, letters and magazines
	Talking	141	Initiate daily conversations with patients
	Ascertain needs	142	Ascertain patients' needs and complaints by talking with patients
		143	Respond to nurse calls
		144	Movements due to calls by patients
	Psychological support	145	Provide encouragement, support, counseling and postoperative psychological care
Education	Counseling and guidance	146	Provide counseling and guidance on meals, medication and urinary tract infection/bedsore prevention; postoperative guidance and education; preoperative guidance and orientation
	Patient education, guidance and counseling	147	Provide guidance on care based on nursing plans (food/fluid intake, excretion, bathing, health management, environment, etc.) and patient education and psychological support
	Family education, guidance and counseling	148	Provide guidance on care based on nursing plans (food/fluid intake, excretion, bathing, health management, environment, etc.) and family education and psychological support
Admission, discharge and outside pass	Care procedure on admission	149	Provide orientation for patients at admission; collect information regarding medical history and lifestyle (including patient/family handling of admission and joint assessment on admission)
	Strolling	150	Accompany patients for a stroll outdoors
	Leisure activities	151	Accompany patients shopping or to get a haircut
Bedding and linen	Bedding and linen changing	152	Get bedding materials; make bed; tuck patients in
		153	Change bedding materials and linens
		154	Prepare necessary items
		155	Clean up afterwards
		156	Air-dry futon
Environment	Hospital facilities	157	Offer to get things or light cigarettes for patients
		158	Organize bedside tables and prepare nurse calls
		159	Prepare and clean-up over tables
		160	Place and remove bed fences
		161	Monitor ventilation and air conditioning; open and close windows; adjust humidifiers; adjust electric blanket temperature; lock doors in some rooms
		162	Adjust light- and sound-proofing; open and close blinds and curtains; turn on and off lights and TV; change TV channels
		163	Clean hospital rooms; sterilize room sinks; empty trash bins; prepare and clean hospital rooms (environmental arrangement); prepare and put away cleaning supplies (including setting up day rooms)
		164	Change water in flower vases; take care of potted plants; take care of small birds; walk guide dogs
Material management for inpatients	Management of (daily use) personal	165	Organize and replace clothes and daily use items; organize unnecessary products; organize lockers; store patient food in refrigerator

and residents	belongings	166	Write names on daily use items and clothes; make name plates
		167	Repair and mend clothes
	Adjunctive devices	168	Manage adjunctive devices for patient use
	Shopping	169	Offer to go shopping for patients and return change
	Money management	170	Manage small amounts of money for patients; make payments at banks
Laundry	Laundry	171	Gather dirty laundry; take dirty laundry to wash room
		172	Washing machine preparation, operation and maintenance
		173	Hand wash dirty laundry
		174	Hang out laundry (indoors or outdoors)
		175	Fold and organize clean laundry
		176	Hand out clean laundry to hospital rooms
Other monitoring	Other monitoring	177	Other monitoring
Admission and discharge	Admission and discharge transportation	178	Transport patients and guide patients to their rooms
Admission, discharge and outside pass	Care procedure at discharge	179	Provide discharge orientation (confirm first outpatient visit, provide information about services after discharge, hand out documents, and deal with patients and family at discharge)
Food, nutrition and fluid replacement	Assist food, nutrition and fluid intake	180	Serve trays in pantry
		181	Clean up around pantry
	Therapeutic nutrition and fluid replacement	182	Monitor tube feeding (nasal and gastric)
	Measurement	183	Measure height, body weight, sebum thickness and resting basic metabolism
	Menu	184	Explain selected menus to patients
Bathroom	Urination maintenance and recovery Urinary function maintenance and recovery	185	Measure residual urine
Consultation, contact and adjustment	Family interview	186	Interview families; contact families; conduct intake interview with families; consult families
	Patient interview	187	Interview patients; contact patients; conduct intake interview with patients; consult patients
	Admission consultation	189	Provide admission consultation with physician; deal with patients and families
Environment	Hospital facilities	190	Set up, adjust and confirm special call buttons

2 Specialized nursing (medication, treatment and other)

Middle classification	Small classification	Care code	Care contents
Drug therapy	Medication (oral agent/suppository)	201	Match prescriptions and dispensed drugs; organize drugs into groups; prepare patients for drug administration; place drugs taken postprandially on bedside table before eating; place drugs taken next morning on bedside table after supper.
		202	Hand out drugs to patients; administer oral drugs and confirm; assist administration; and inject drugs into liquid food
		203	Insert suppository (laxative, fever reducer, etc.)
	Injection	204	Subcutaneous and intramuscular injection preparation, implementation, assessment and clean-up
		205	Intravenous injection preparation, implementation, assessment and clean-up
		206	Continuous intravenous injection preparation, implementation, assessment and clean-up
		207	Central intravenous injection preparation, implementation, assessment and clean-up
		208	Epidural and other injection preparation, implementation, assessment and clean-up
	Fluid and blood transfusion	209	Prepare drip infusion, intravenous hyperalimentation (IVH) and blood transfusion (including cross match)
		210	Perform drip infusion, intravenous hyperalimentation (IVH) and blood transfusion
		211	Drip infusion, IVH and blood transfusion rate adjustment, observation and changing; venous pressure measurement
		212	Fluid and blood transfusion fixation, and upper and lower extremity restraint

		213	Drip infusion, IVH and blood transfusion removal and clean-up
	Drug management	214	Drug shelf and cart management, non-prescription drug management, and cool box management
Therapy and treatments: respiratory system	Suctioning	215	Suctioning implementation, preparation and clean-up
	Inhalation	216	Inhalation therapy and nebulizer preparation, implementation and clean-up
		217	Oxygen inhalation preparation, implementation and clean-up (tent method, transnasal catheter method and mask method)
	Bronchial drainage	218	Tapping, postural drainage and sputum vibrator preparation, implementation and clean-up
		219	Postoperative lung physiotherapy
	Airway maintenance and artificial respiration	220	Hyperbaric oxygen therapy pre-education, care and management
		221	Endotracheal intubation preparation, implementation, clean-up and airway maintenance
		222	Tracheotomy, tracheostomy care, and cannula changing, preparation and clean-up
		223	Monitor respirator and artificial ventilator usage
Circulatory system	Hot and cold therapy	224	Hot and cold therapy, hot and cold compress, hot water bottle, ice bag, and ice pillow preparation, implementation and clean-up
	Cardiopulmonary function maintenance and recovery	225	Aortic balloon pumping preparation, assistance, monitoring, care and management
		226	Mechanical heart and lung preparation, assistance, monitoring, care and management
	Impulse conducting system maintenance and recovery	227	Provide nursing care for rapid changes, severe and grave conditions, such as counter shock (defibrillator operation), and perform cardiopulmonary resuscitation
Nephrourinary system	Artificial dialysis	228	Dialysis (HD and CAPD)-related care
	Hemodialysis and peritoneal perfusion-related care, urinary function maintenance and recovery	229	Urethral and bladder/cytostomy catheter changing
		230	Bladder and renal pelvic irrigation preparation, implementation and clean-up
		231	Preparation, implementation and clean-up of urological procedures (excluding catheterization and bladder and renal pelvic irrigation)
Motor system	Traction and fixation	232	Preparation, observation and clean-up for traction in bed
		233	Plaster wrapping and cutting preparation and clean-up
Skin	Skin therapy and protection	234	Bedsore and surgical wound treatment and dressing change; ointment application; medicated bath; skin care preparation, implementation and clean-up; ointment mixing; effusion volume measurement; skin care cream application
Sensory system	ENT therapy, procedure and care	235	Eye drop, eye ointment, nasal drop and ear drop preparation, implementation and clean-up; nasal bleeding treatment; eye mucus wiping; disease-related nasal discharge wiping
		236	Otological procedure assistance preparation, procedure assistance and clean-up
Reproductive system	Female reproductive organ procedures	237	Vaginal douche and gynecological procedure preparation, implementation and clean-up
Surgery-related	Continuous suctioning	238	Preparation, insertion assistance, and clean-up of catheters, including continuous suctioning (milking)
	Before and after surgery	239	Preparation, implementation, and clean-up of preoperative procedures, including shaving
	Minor surgery	272	Preparation, assistance, and clean-up for minor surgery
Neonatal-related	Neonatal jaundice	240	Phototherapy (neonatal)-related care and management
	Systemic function maintenance and promotion	241	Incubator monitoring, assessment, care and parent (family) education and management
Radiotherapy	Radiotherapy	242	Small-sealed radiotherapy preparation and assistance
		243	Advanced preparation of external radiotherapy
Testing, sampling and treatment	Sampling	244	Collect samples (feces, urine, sputum, blood, etc.)
		245	Prepare samples and clean up afterwards
	Testing	246	Blood therapy (exchange transfusion and bone marrow grafting), angiography assistance and fixation during testing
		247	Insert catheter for testing (urinary and gastric duct)
		248	Urine specific gravity, blood glucose, blood and urinary sugar tests

		249	Test preparation and clean-up
	Respiratory and circulatory system testing	250	Assist EKG, respiratory function tests and hospital tests
		251	Cardiac catheterization and Swan-Ganz catheter, pretreatment and post-test care
		252	EKG preparation, implementation and assessment
	X-ray and Diagnostic imaging	253	X-ray preparation and assistance (CT, MRI, etc.)
		254	Echography preparation and assistance, clean-up
		255	Doppler test implementation and assessment
		256	Isotope test preparation
	Endoscopy	257	Endoscopy explanation, implementation and assistance, and management and guidance after testing
	Sensory organ (eye, ear , nose)	258	Fundoscopy preparation, implementation assistance and post-test guidance
	Nephrology and urology	259	Renal clearance explanation and implementation
	Sugar metabolism	260	Glucose tolerance test preparation, explanation and implementation
	Others	261	EEG preparation and post-test care
		262	Other test explanation, assistance and clean-up
		263	Test material preparation and clean-up
		264	Monitor with continuous assessment
Therapy assistance	Examination assistance	265	Examination assistance, preparation and clean-up
Infection prevention	Infection prevention	266	Wear preventative gear, and gown-wearing technique
		267	Change hand washing and antiseptic solutions
		268	Isolation and discharge preparation and clean-up
		269	Sterilize used materials, urine collecting devices, bedpans and portable toilets
		270	Dispose of dirty materials and used injection needles
Postmortem care	Postmortem care	271	Postmortem care
Drug therapy	Drug preparation	272	Dispense oral agents and injections
		273	Prepare oral agents and injections
	Drug dispensing and delivery	274	Deliver drugs to wards and hand out drugs to outpatients
	Prescription	275	Prescription confirmation, monitoring and tabulation
	Pharmacy management	276	Drug management (purchasing, ordering, stock confirmation and management, filling prescriptions and confirmation of expired drugs)
		277	Organize, rearrange and clean dispensing shelves and rooms, clean powder folders

3 Tasks related to rehabilitation (Functional training)

Middle classification	Small classification	Care code	Care contents
Motor system function assessment	Joint range of motion	301	Joint range of motion and mobility assessment ; etc
	Muscle strength	302	Muscle strength assessment and test
	Others	303	Muscle tension assessment; reflex and sensory tests; pain assessment; etc.
Motor system function training	Motor system function maintenance, recovery and promotion	304	Joint range of motion training
		305	Muscle strengthening training
		306	Swallowing training
		307	Upper extremity function and finger movement training
		308	Coordination training
		309	Endurance training
Expanding basic living movements	Explaining basic movement training	310	Explain the contents, objective and procedures for movement training, such as rolling over, getting up, sitting position, standing up, standing position, transfer movements, wheelchair maneuvering/operation and walking
	Demonstrating basic movements	311	Demonstrate basic movements (rolling over, getting up, sitting position, standing up, standing position, transfer movement, wheelchair maneuvering/operation and walking)
	Assessing basic movements	312	Assess rolling over, getting up, sitting position, standing up, standing position and transfer movements, wheelchair maneuvering/ operation, gait and walking ability
	Rolling over	313	Rolling over training: verbal instruction and monitoring
		314	Rolling over training: partial assistance
		315	Rolling over training: significant assistance
	Getting up	316	Getting up training: verbal instruction and monitoring
		317	Getting up training: partial assistance

	318	Getting up training: significant assistance
Sitting position	319	Sitting position training: verbal instruction and monitoring
	320	Sitting position training: partial assistance
	321	Sitting position training: significant assistance
Standing up	322	Standing up training: verbal instruction and monitoring
	323	Standing up training: partial assistance
	324	Standing up training: significant assistance
Standing position	325	Standing position training: verbal instruction and monitoring
	326	Standing position training: partial assistance
	327	Standing position training: significant assistance
Balance	328	Balance training: verbal instruction and monitoring
	329	Balance training: partial assistance
	330	Balance training: significant assistance
Transfer	331	Transfer training: verbal instruction and monitoring
	332	Transfer training: partial assistance
	333	Transfer training: significant assistance
Wheelchair	334	Wheelchair maneuvering/operation training: verbal instruction and monitoring
	335	Wheelchair maneuvering/operation training: partial assistance
	336	Wheelchair maneuvering/operation training: significant assistance
Walking	337	Walking training: verbal instruction and monitoring
	338	Walking training: partial assistance
	339	Walking training: significant assistance
Prosthetic fitting	340	Prosthetic fitting training: verbal instruction and monitoring
	341	Prosthetic fitting training: with assistance
Assessing	342	Assess activities of daily living, such as eating, going to the bathroom, changing clothes, bathing, personal appearance and cooking
Activity of daily living training	343	Training for movements associated with eating
	344	Training for movements associated with going to the bathroom
	345	Training for movements associated with changing clothes
	346	Training for movements associated with bathing
	347	Training for movements associated with personal appearance
	348	Training for movements associated with transfer
	349	Training for movements associated with cooking
	350	Training for movements associated with chores
Physical therapy	Traction in rehabilitation	351	Explanation, preparation, implementation and confirmation
		352	Result confirmation and clean-up
	Thermotherapy	353	Explanation, preparation, implementation and confirmation
		354	Result confirmation and clean-up
	Electrotherapy	355	Explanation, preparation, implementation and confirmation
		356	Result confirmation and clean-up
	Massage	357	Massage
Exercise therapy	Exercise therapy	358	Neuromuscular facilitation techniques, etc.
Assessment of higher brain function	Assessment of higher brain function	359	Assess intellectual and mental functions and apraxia/agnosia
Language therapy	Assessment	360	Assess communication and aphasia; conduct articulation disorder and aphasia tests
	Training	361	Help patients to exercise voice and speech organs and practice vocalization and articulation
Occupational therapy	Function assessment from the viewpoint of occupational therapy	362	Assess swallowing (eating function), upper extremity function, finger movement, coordination, endurance and work performance
	Playing	363	Provide guidance on and implement passive, active, visual, auditory, tactile, vestibular sense, constructive, drawing and intellectual group plays
	Wood working and crafts	364	Leather, bamboo and wisteria crafts; knitting; handcrafts; ceramics; model building; block print; penmanship; carving; metal work and simple work

	Training	365	Pulley training; Cerablast training; writing instrument, writing material and musical instrument usage training; office work training (typing, computers)
Other rehabilitation -related	Others	366	Training tool preparation and clean-up
		367	Training material and splint preparation; product finishing and correction
		368	Select and check out prostheses and therapeutic tools
		369	Home remodelling-related assessment, remodelling evaluation, draft preparation and records
Amputation assessment and training	Amputation assessment and training	370	Assess stumps and prostheses
		371	Stump management, prosthesis training and weight-bearing training
Motor system function assessment	Motor system function maintenance, recovery and promotion	372	Assess swallowing function (including VF, etc.)

4 Care system management (contact, report, meeting and seminar)

Middle classification	Small classification	Care code	Care contents
Events and group activities	Events and group activities	401	Planning and preparation; group journal, event record, picture and material organization; facility public relations documents
		402	Assist group and recreational activities)
		403	Host events
		404	Clean up after events
	Decoration and displaying	405	Decorate rooms and hallways and display exhibits
	Funeral, etc.	406	Wake and funeral preparation, attendance and clean-up
Communication, reporting and information collecting	Collecting information from family	407	Talk and collaborate with families; collect information about disease history, overall lifestyle and family history
	Communication, instruction and coordination among staff, and record confirmation	408	Communicate, meet and talk among staff; look for and contact other staff; contact other departments via telephone; pass temperature-taking table from ward manager to nurses
		409	Receive instructions from doctors; confirm with doctors
		410	Disseminate information to other staff members
	Communication with outside and other agencies	411	Communicate with healthcare professionals, administrators, prosthetists and volunteers; collect information; take outside calls during night shift; communicate with healthcare professionals and administrators
Care-related meetings and records	Confirming records in care-related meetings and slips	412	Hold case meetings and conferences; care planning and individual care planning; confirm KARDEX and slips (including periodic and mini conferences)
	Records	413	Enter KARDEX and nursing records, ADL assessment records, rehabilitation records, case records, individual care records and visit notes; enter and send admission/discharge records, admission/placement ledger records and medical certificates into computer and electric media; take notes
	Organization	414	Organize admission charts, X-ray films, slips and files; copy documents; prepare and organize chart data
Work related	Work charts and daily schedules	415	Prepare work charts and daily schedules; enter nurse and caretaker journals (including daily reports, monthly reports and submitted documents)
	Other meetings	416	Staff meetings, other meetings and committees
Facility and inventory maintenance and management	Facility and machine maintenance and management	417	Maintain, inspect, repair, change and collaborate with facility systems and machines (including EKG, ventilator, wheelchair and bed); inspect and manage door locks
	Ordering and managing treatment hardware and consumable supplies	418	Manage and purchase injection slips, sterilizing agents, treatment devices and instruments; order and purchase clothes and articles of daily use; check and order linens and diapers
Indoor organization and cleaning	Nurse and caretaker offices	419	Organize, rearrange and clean staff offices
	Common areas and rooms	420	Organize and rearrange treatment, equipment, trash and play rooms; clean and sterilize common areas, hallways, yards, windows and plants; take out trash; clean children's/spouses' rooms

Training and guidance	Training and guidance	421	Hospital/facility training; provide guidance to (new) staff, interns and volunteers
While working nightshift	Stand by	422	Stand by for night shift, stand by at station during day shift, and wait for tray carts to reach wards
	Nap taking	423	Take a nap while working night shift
Staff behaviors	Movement of staff	424	Staff movement; borrow stretcher from another ward, *: Movement of staff
	Changing clothes for work	425	Change into appropriate clothes
	Lumbar pain exercise	426	Exercise to maintain and manage health
	Eating and taking a break	427	Take breaks (including staff meal break and bathroom breaks)
	Personal time	428	Use the telephone, go out, meet and have private conversation with other staff members
Communication, reporting and information collection	Communication, instruction and adjustment among staff, and record confirmation	429	Collect information from records (paper charts, electric charts and KARDEX)
		430	Prepare ward bulletins
Others	Ward medical work	431	Fill out co-pay claims; organize charts; office work such as, return documents and films
	Ward general affairs	432	Manage office goods; perform secretarial duties for ward managers

5 Home care-related

Middle classification	Small classification	Care code	Care contents
Food, nutrition, and fluid replacement	Cooking	501	Prepare and preserve food
		502	Change gastric tubes (transnasal catheter)
		503	Monitor gastric tubes (transnasal catheter)
Other procedures, tests and treatments	Testing	504	Home test and measurement (X-ray, EKG and blood glucose, etc.) preparation, implementation and clean-up
	Inspection of medical devices	505	Inspect home oxygen aspirator and other devices
	Injection	506	Self-injection guidance and management
Bathing assistance	In the bathroom	507	Help patient to get into tub
Drugs	Periodic medication preparation	508	Organize drugs into groups by the periods at which they are taken; arrange drugs to make them easier for patients to take
Social activity	Application	509	Fill out and submit applications
	Activity	510	Manage bulletins, deal with visitors, and deal with welfare services
Emergency response	Dealing with falls, etc.	511	Emergency treatments, etc.
Transportation (Transportation services)	Start of transportation	512	Leave the center to transport patients
	End of transportation	513	Return to the center after an appointment
	Vehicle operation	514	Drive a vehicle for transporting patients
	Machine operation	515	Operate a lift or wheelchair lift
	Vehicle maintenance	516	Inspect, repair, fuel and wash, etc.
Home visit	Coming and going from home visit	517	Leave the hospital for a home visit or return to the hospital from a home visit
	Home visit	518	Patient home survey, environment check and lifestyle check

6 Related to care services for children

Care services for children	Small classification	Care code	Care contents
	Affection-related	601	Sing a song
		602	Hold and carry the child
		603	Move while holding
		604	Gently tap and rub the child's back
	Food (breast milk and weaning food)	605	Prepare milk
		606	Help with breast feeding
		607	Clean up and put things away after breast feeding
		608	Prepare weaning food
		609	Help with weaning food feeding
		610	Clean up and put things away after weaning food feeding

3) Standardization of care through care codes

Standardizing the content of care provided to patients, elderly persons in need of care, infants, emotionally disturbed children, and other users requires three questions to be answered: 1) what is the condition of the user, 2) what care is needed, and 3) how much care is needed. Without this information, the procedures and methods for providing care in facilities cannot be systemized. The first question concerns the assessment of the elderly person's condition, the second is linked to the codification of the content of care, and the third with the quantification of care provided. If any of these questions are unresolved, then the care or, more precisely, the quantity of care, cannot be standardized.

During the standardization of care that occurred in the late 1990 s and the development of T.C.C, almost none of the scientific analysis was based on objective data. At this time, information about care was mostly coming from case studies, with a large variation concerning the quantity and coverage of care according to the knowledge and experience of the care provider. In facilities, massive amounts of information on the content of care were accumulated in work logs and medical records, but without any formal consistency at the national level they were thus impossible to be used as a database. In practice, such field information was impossible to use for the standardization of care.

However, at the time, to introduce the Long-Term Care Insurance System, the question of "how much care is needed" (quantity) had to be answered. Quantification simply consists of placing a numeric value on the characteristic of a particular event, but specific rules have to be defined and applied through this entire process. In other words, to measure care and to quantify an event, this care or event must first be defined clearly. This is linked to the question of "what care is needed". Even if this question is answered, the problem of knowing whether it is possible to measure a codified care content or to express the quantity in minutes still remains.

Another salient issue emphasized in the field of social welfare concerned psychosocial care. For example, expressing a quantity for a care, mainly qualitative, that aims at psychological stability would be difficult. However, by determining what kinds of activities are needed to reach this psychological stability, expressing this quantity in terms of time becomes possible. One purpose of care codes is precisely to codify these types of abstract care contents.

4) Development process and overall picture of original T.C.C in fields of long-term, nursing, and care services for children in Japan

1) History of development of T.C.C

Through a large-scale one-minute time-and-motion study, the work of care staff providing services in the field of long-term care , nursing care, and care services for children was measured. Table 2 presents some of the results.

The first prototype of T.C.C was developed in 1987 as a "care menu"; it included 110 codes divided into 9 categories[31].

In 1992, Japan chose 60 special nursing homes for the elderly regarded as high quality care providers to expand the number of codes to 278, divided into 13 categories: "Personal care"

with 150 codes, "Communication with the resident" with 13 codes, "Motivation in life and interest" with 7 codes, "Management of health maintenance" with 33 codes, "User's mobility" with 11 codes, "Report" with 4 codes, "Reporting and corresponding" with 10 codes, "Guidance and orientation for the user" with 5 codes, "Meeting and reunion" with 2 codes, "Management work" with 20 codes, "Internship of employees" with 4 codes, "Management of the facility" with 14 codes, and "Other" with 5 codes (Table 2)[35].

Table 2: Proto-type Total Care Code in 1992

	Content of care (category)	Number of care codes
1	Personal care	150
2	Communication with the resident	13
3	Motivation in life and interest	7
4	Management of health maintenance	33
5	User's mobility	11
6	Record	4
7	Reporting and corresponding	10
8	Guidance and orientation for the user	5
9	Meeting and reunion	2
10	Management work	20
11	Internship of employees	4
12	Management of the facility	14
13	Other	5

In 1995, the content of care provided in the home was codified, and assistance work for medical examinations occurring in hospitals with intensive care for elderly patients was taken into consideration, leading to a re-organization of the categories of the 1992 T.C.C for long-term care: "Personal care" with 181 codes, "Medication, treatment, procedure" with 34 codes, "Functional training" with 69 codes, "Event, communication, report, reunion, internship and other" with 27 codes, and "Tasks related to home-care" with 10 codes (Table 3). These 5 categories, including a total of 321 codes, enabled the quantity of care provided through long-term care-related services in Japan to be determined[8].

Table 3: Total Care Code from 1995 to 2007

	Content of care (category)	Number of care codes			
		1995	1997	2007	2008
1	Personal Care	181	178	189	189
2	Specialized nursing care (Medication, treatment and other)	34	71	78	78
3	Tasks related to rehabilitation (Functional training)	69	69	72	72
4	Care system management (contact, report, meeting and seminar)	27	28	32	32
5	Tasks related to home-care	10	10	10	18
6	Tasks related to care services for children	—	—	—	10

In 1997, the Medical Division of the Ministry of Health, Labour and Welfare conducted a study called "Assessment research on the quantity of long-term care provided in a fixed

remuneration system" in order to include the long-term care activities in a comprehensive remuneration system for all the institutions involved. This research revealed a need to create and revise care codes especially regarding long-term care occurring in acute hospitals. This revision established 5 categories for a total of 362 care codes: "Medical care" with 178 codes, "Specialized nursing care (medication treatment, procedure)" with 71 codes, "Functional training" with 69 codes, "Event, communication, report, internships and other" with 28 codes, and "Tasks related to home-care" with 16 codes (Table 3). From 2000 to 2005, these codes were used to measure the quantity of care provided in acute hospitals throughout Japan[36]. The results of these analyses on the quantity of care were used to systemize the care-needs certification process occurring in the Long-Term Care Insurance System and to design the screening process used to determine the nursing care level covered by the Medical Insurance System. These results are still currently used and are at the core of policy decisions.

In 2007, research on the quantity of care was extended to sub-acute rehabilitation hospitals through another revision of the codes: "Medical care" with 189 codes, "Specialized nursing care (medication treatment, procedure)" with 78 codes, "Functional training" with 72 codes, "Event, communication, report, internships and other" with 32 codes, and "Tasks related to home-care" with 18 codes (Table 3)[37]. This total of 389 codes divided into 5 categories includes specific codes for rehabilitation and a broader cover of medical care.

In 2008, the research included, for the first time in Japan, infant homes affiliated with hospitals[38]. This led to establishment of 6 categories for a total of 399 codes: "Medical care" with 189 codes, "Specialized nursing care" with 78 codes, "Tasks related to rehabilitation" with 72 codes, "Tasks related to the care system" with 32 codes, "Tasks related to home-care" with 18 codes, and "Tasks related to care services for children" with 10 codes (Table 3).

The TTC, implemented in 1989 and under development since then, covers quite extensively the field of rehabilitation, long-term care, social care, and care services for children with a total of 399 codes. Using these codes enabled deeper analyses and depicted more accurately the actual situation in the field of interpersonal care services.

2) National Surveys and adjusted T.C.C: nature of revision and adjustment issues

As T.C.C is unique to Japan and comprehensively include the fields of care services for children, long-term care, and nursing care, researchers and policy makers have used it abundantly.

The original T.C.C. presented above was adjusted many times to conduct other time studies and to answer the needs of policy makers. The T.C.C was especially revised in 2006 for the project "Research for the development of indicators to assess mental and physical care needs of users of various generations," financed by a research grant from the Ministry of Health, Labour and Welfare. This resulted in 10 T.C.C categories and a total of 245 codes[39]. The same year, this reformed code system was used in research by the Elderly Health Division of the Ministry of Health, Labour and Welfare that was conducted in 20 special nursing homes for the elderly (1098 persons), 11 convalescent wards for the elderly requiring care (642 persons), and 29 long-term care health facilities (1779 persons).

Within this reformed code system, the codes concerning care for demented elderly persons were at the center of many difficulties. Unfounded opinions that the system was underestimating the care needs of persons with dementia led to the addition of special codes such as "Care of demented persons". However, it is a well-known fact in clinical practice that caring for a demented elderly person is not different in nature from caring for a non-demented elderly person. Thus, even if the services provided by the staff were the same, the use of care codes specific to dementia significantly confused the interpretation of the results from the above-mentioned research. This reform was clearly made without a proper understanding of the care codes and their significance.

Moreover, the same reformed codes were used again in a 2011 survey conducted in group homes and unit-type homes for the elderly to assess the physical and mental condition of elderly persons[40]. This research was conducted over 26 persons in unit-type homes for the elderly (2 facilities) and 18 persons in group homes (4 facilities), and it enabled a calculation based on T.C.C.

The codes already used in the fields of long-term care and nursing care did not include codes specific to foster homes, so opinions from a convention of foster homes and short-term institutions for emotionally disturbed children as well as from the committee of the Social Security Council for Child Protection were collected.

During this reform process, the system of T.C.C was not sufficiently explained, leading to suppression of care codes irrelevant to care services for children and the creation of new ones concerning "Attachment, communication," "Special guidance and council," "Self-reliance support" for children becoming gradually more independent (school guidance, professional career guidance, care guidance), "After care" so that not only institutionalized children but also children out of care could be judicially taken into consideration, "Resources other than familial and institutional" to establish a collaboration with other institutions, such as Child Guidance Centers, and to support and council both the children and the family when they are reunited, and "Child advocacy" for the protection of children's rights in order to prevent, for example, maltreatment inside institutions. These changes led to a total of 436 care codes[41].

However, it would have been wiser to simply ignore care codes that were not originally concerned with care services for children instead of suppressing them. Furthermore, as explained above, this revision of T.C.C included care codes such as "Special guidance and council" to integrate new specialist professions, "Self-reliance support" to support the independency of children (through school, career, and care guidance), and "After care" to judicially take into consideration out-of-care children. However, none of these codes concerned services that can be measured through a time-and-motion study.

Nevertheless, the former five categories of T.C.C ("Personal care," "Specialized nursing care," "Tasks related to rehabilitation," "Tasks related to the care system," "Tasks related to home-care") were adapted to the field of care services for children and replaced by nine categories: "Personal care," "Attachment, communication," "Support of events," "Support for entry and exit of care," "Guidance, council, functional training, self-reliance support," "Health, medical tasks," "Resources other than familial and institutional," "Support for the mother," and "Tasks not

directly involved with the child." Each task within these categories should have been measured using a time-and-motion study, but as "Support for entry and exit of care," "Guidance, council, functional training, self-reliance support," "Health, medical tasks," and "Resources other than familial and institutional" cannot be distinguished by the observer, this adaptation of T.C.C to the field of care services for children could be said to have included meaningless categories. Nevertheless, this system was used in a 2009 national survey that took place in 21 foster homes, 4 infant homes, 3 short-term therapeutic institutions for emotionally disturbed children, 2 children's self-reliance support facilities, and 4 mother and child living support facilities.

In 2010, to enable the quantification of work in preschools, certified playschools, and clubs for after-school activities, other changes were made in the care codes, leading to 9 categories of 423 codes (424 in the pilot survey). These codes are different from those used for the long-term care of elderly persons, but some of them were adapted to allow an analysis based on the same code system as the T.C.C[42].

Even though the data collected in this research were very valuable and are still the basis of many studies, the fact that this method of measuring care tasks was never used inside children's institutions leads to some difficulties. Most of them were overcome, but the poor comprehension of the researchers involved led only to studies, without concrete applications in terms of political measures.

The history of T.C.C started in 1987 with long-term care services and has continued to evolve, even as recently as 2010 with a codification of care services for children. T.C.C has led to a unique code system developed over 24 years. As stated above, this development process also included, with the addition of very different codes, a period of incomprehension about the system. Overall, however, T.C.C was and still is an undeniable contribution to the standardization of care services in Japan.

5．Conclusion

The cost of services is usually driven by market supply and demand. However, long-term care, nursing care, and care services for children are publicly funded, and it is the government that fixes their cost. Half of the resources for providing these services comes from taxes, and the other half comes from the mandatory insurance premiums collected nationally. The Japanese government collected data concerning the quantity of care provided in the field of long-term care and used these data as the basis of the Long-Term Care Insurance System. This was the beginning of an evidence-based policy in Japan.

The first step symbolizing the beginning of this evidence-based policy for the Long-Term Care Insurance System was the implementation of the care-needs certification system. This system is based on logic unique to Japan and is recognized as being very sophisticated. However, its logic cannot be understood without some knowledge about the method for quantifying work and the purpose behind the development of T.C.C. Most of the criticism behind the care-needs certification system seemed to be based on a poor understanding of the care code system and

a lack of theoretical knowledge.

The nature of care services is becoming increasingly abstract, but to evaluate the concrete services provided, an overall comprehension of T.C.C would be very helpful. This paper supports the idea that the method used to collect data about care services was carefully chosen and that some of the criticism against the care-needs certification system may be unfounded. Overall, measuring the quantity of care tasks through time-and-motion studies and the use of T.C.C, as in the case for the Long-Term Care Insurance System, is becoming increasingly recognized in the medical, social, and healthcare fields.

It is expected that, in the future, care services in those fields will be commercialized in a quasi-market. When this change occurs, the collection of data about the nature and quantity of care and the T.C.C will be very valuable to fix the cost of services. Obviously, collecting evidence about the concrete tasks involved and the time needed to conduct them are pre-requisites for the determination of these costs.

Japan has succeeded in covering to a certain level the costs of medical and long-term care services through social insurance, but issues concerning the low remuneration of long-term care providers have been raised recently and are throwing discredit on the way the prices of care services are decided. This paper suggests that these issues are instead inherent to the increasingly abstract nature of many services and that the use of T.C.C could be the key to supporting the veracity of this phenomenon.

In the future, to cover publicly long-term care expenses in the context of an ageing population and an expansion of care needs, sufficient evidence needs to be found when determining the prices of care services rationally. The type of knowledge presented here may be helpful when examining the remuneration of care system.

References

1) Wright MJ. Improvement of Patient Care, New York, G. P. Putnam's Sons, 1954:109-125.

2) Abdellah F, Levine E. Work-Sampling Applied to the Study of Nursing Personnel, Nursing Research 1954;3(1): 11-16.

3) Domenech M, Payton O, Hill J, et al. Utilization of Physical Therapy Personnel in One Hospital, Physical Therapy 1983;63(7): 1108-1112.

4) Hsiao WC, Braun P, Becker ER, et al. The Resource-Based Relative Value Scale, Journal of the American Medical Association 1987;258(6):799-802.

5) Tang Z, Weavind L, Mazabob J, et al. Workflow in intensive care unit remote monitoring: A time and-motion study. Critical Care Medicine, 2007;35(9): 2057-2063.

6) Taylor FW. "Stop management" in Scientific Management, Harper & Brothers,1903.

7) Tsutsui T, Muramatsu N. Care Needs Certification in the Long-Term Care Insurance System of Japan, Journal of the American Geriatrics Society 2005;53(3):522-527.

8) Zenkoku shakai fukushi kyôgikai (National council of Social welfare). Service kyôkyû shihyo chôsa kenkyû jigyô hôkokusho (Report from the research plan on indicators of service provision), 1995.

9）Yamauchi K, Ikegami N, Igarashi C, et al. Eligibility Classification for long-term care insurance-Developing a comprehensive Classification-, Journal of the Japanese Society on Hospital Administration, 1998;35 (3):185-196.
10）Ikegami N, Fries BE, Takagi Y, et al. Applying RUG-III in Japanese Long-term Care Facilities, Gerontologist 1994;34: 628-639.
11）Ikegami N, Yamauchi K, Igarashi C, et al. Eligibility Classification for long-term care insurance-Comparison of the "Comprehensive Eligibility Classification" with the Ministry of Health and Welfare's proposed method-, Journal of the Japanese Society on Hospital Administration, 1998;35(3): 197-204.
12）Ikegami N, Yamauchi K., Kawagoe M. et al. Eligibility Classification for long-term care insurance-Verifying the present method with the "Comprehensive Eligibility classification"-, Journal of the Japanese Society on Hospital Administration 2000;37(4): 305-313.
13）Lurie N, Rank B., Parenti C, et al. How Do House Officers Spend Their Nights? A Time Study of Internal Medicine House Staff on Call, New England Journal of Medicine 1989;320(25):1673-77.
14）Kobayashi R. Tokubetsu yôgo rôjin hômu ni okeru idôhojogu to nichijô seikatsu kôdô (Mobility tools, activity of daily living in special nursing homes for the elderly), Jinbungakuhô(Human studies) ,Shakai fukushi(Social Welfare) 1992;8:81-107.
15）Tsutsui T. The relationship between the actual state of Nursing service provided at acute care units and patients' clinical status (The first report) -A study on "the incidence" of nursing service provided to patients and "the mean nursing time"-, Journal of the Japanese Society on Hospital Administration 2000;37(2):15-24.
16）Tsutsui T, Higashino S. The status of nursing care in acute care hospitals and condition of patients (3 rd report) -Comparison of age groups, disease ,and time of admission / release for patients in hospital 30 days or less-, Journal of the Japanese Society on Hospital Administration 2003;40(2):39-45.
17）Tsutsui T. The status of nursing operations and the condition of patients at acute care hospital facilities(2 nd report)-The condition of elderly patients and special characteristics of nursing operations provided-, Journal of the Japanese Society on Hospital Administration 2002;39(2):13-22.
18）Tsutsui T, Higashino S. Research on the state of patients in intensive care units in Japan and related characteristics. Journal of the Japanese Society on Hospital Administration 2006;43(2):43-52.
19）Tsutsui T, Higashino S. Comparison of the characteristics of patient groups in a hospital ICU, High-Care Unit, and General Unit according to illness-severity criteria and need for nursing-Development of a scale to evaluate the degree of patients' need for nursing-. Journal of the Japanese Society on Hospital Administration 2008;45(1):37-48.
20）Giovannetti P. Understanding patient classification systems, J Nurs Adm, 1979;9(2): 4-9.
21）Giovannetti P, Johnson JM. A new generation patient classification system, J Nurs Adm 1988; 20(5): 33-40.
22）Phillips CY, Castorr A, Prescott PA. et al. Nursing intensity. Going beyond patient

classification, J Nurs Adm 1992;22(4): 46-52.
23) Levenstam, AK, Engberg IB. The Zebra system -A new patient classification system. J Nurs Manag 1993;1(5): 229-37.
24) Tsutsui T, Otaga M, Higashino S. Research for the development of a Foster care need index" for children requiring protection -Quantification of evaluations using data on the presence or absence of emotional or behavioral problem-), Review of Management and Information 2011; 23(2):15-27.
25) Ishibashi K. Time study chôsa ni yoru hômu herupu rôdô senmonsei no kenshô (Validation of home work expertise through time study), shakai bunka ronshû 6, Hiroshima daigaku daigakuin shakaikagaku kenkyûka, 1999;139-159.
26) Fukuda A, Umezaki K, Kojima S. Kaigo hokenka no zaitaku kaigo shien sentâ -Taimu sutadi ni motozuku arikata no kenkyû- (Home care facilities covered by long-term care insurance -A time study-), Journal of health and welfare statistics, 2003;50(15): 8-13.
27) Watanabe Y. Time-study chôsa dêta katsuyô ni yoru tokubetsu yôgo rôjin hômu ni okeru kaigo no shimyurêshon bunseki (Simulation of care provided in special nursing homes based on data from time study), Japanese society for the study of social welfare 1992;33(2): 243-269.
28) Onodera, N., Ooshita, S., Teramoto, T. et al. Tokubetsu yôgo rôjin hômu ha nyûkyôsha no jûdoka ni taerareru ka? -Taimu sutadi ni motozuku saiteki nyûkyosha kôsei no shimyurêshon- (Can special nursing home deal with the increasing severity of patient's condition? -Optimal management simulation based on time study-), Journal of health and welfare statistics 2004;51(4): 14-17.
29) Yamashita T, Kindaiteki kanri riron josetsu -teirâ shisutemu hihan- (Preface to modern management theory -Critic of Taylor's system-), Mineruba shobô, Tokyo, 1980:252-253.
30) Kijne HJ. Time and Motion Study, Spencer.J.C.& Kijne,H.J.(eds.), Scientific Management:Frederick WinslowTaylor's Gift to the World?, 1997.
31) Hirano H. Shinsagyô kenkyû -Gendai monozukuri no kihon gijutsu- (New research plan -Basic techniques of modern manufacturing-), nikkan kôgyô shinbunsha.2001
32) Brisley CL.Work Sampling, in Industrial Engineering Handbook, Edited by H. B. Maynard, New York, McGraw Hill, 1971.
33) Gillanders W, Heiman, M. Time Study Comparisons of Three Intern Programs, Journal of Medical Education 1971;46:143-49.
34) Tsutsui, T. Kôreisha no nichijô seikatsu nôryoku ni kansuru kenkyû (Research on elderly persons and their ability to perform daily life activities), Nihon shakai jigyô daigaku daigakuin shakai fukushigaku kenkyûka shûshi ronbun, 1991;76-78.
35) Tsutsui T. Tokubetsu yôgo rôjin hômu no kaigo shokuin ni okeru kaigo futankan no sûryôka ni kansuru kenkyû (Quantification of the burden of care felt by employees of nursing homes), Japanese society for the study of social welfare, 1993; 34(2): 43-82.
36) Tsutsui T. Kango hitsuyôdo no kaihatsu to sono ôyô (Development and application of mursing care level), Iryô bunka sha, Tokyo, 2003;9-16.
37) Heisei 19 nendo kôsei rôdô kagaku kenkyûhi hojokin (chôju sôgô kagaku kenkyû jigyô)

Zaitaku ni okeru yôkaigo-yôshien kôreisha ni hitsuyôna kaigo sâbisu ryô wo suitei suru moderu no kaihatsu ni kansuru kenkyû (Development of model to estimate the quantity of care provided to care or support need certified elderly persons in home or institution), kôsei rôdô kagaku kenkyû chôju kagaku sôgô kenkyû jigyô, hôkokusho, 2008.3

38) Heisei 20 nendo kôsei rôdô kagaku kenkyûhi hojokin (kodomo katei sôgô kenkyû jigyô) Yôhogo jidô ni okeru higyakutai ni yoru mondai ya shôgai nado no ruikeika sareta jôtaizô to kea no hitsuyôryô no sôgokanren ni kansuru kenkyû (Interrelation between quantity of care needs and condition of children in care according to the classification of disorders and issues due to maltreatment), kôsei rôdô kagaku kenkyûhi kodomo katei sôgôkenkyû jigyô, hôkokusho, 2009.3

39) Heisei 19 nendo kôsei rôdô kagaku kenkyûhi hojokin (chôjû sôgô kagaku kenkyû jigyô) Tayôna sedai oyobi shinshin no jôtai ni chakumoku shita yôkaigo jôtai no hyôka shihyô no kaihatsuni kansuru kenkyû hôkokusho (Development of indicators for the assessment of care needs focusing on physical condition and intergenerational suppor),2007.3

40) Heisei 22 nendo rôjin hoken kenkô zôshin to jigyô. kôreisha no shinshinjôtai no tekiseina hyôka hôhô no kaihatsu ni kansuru chosa kenkyû (Nihon kôshû eisei kyôkai) hôkokusho (Development of effective method to assess the physical condition of elderly persons (Japan Public Health Association)), 2011.3

41) Higashino S, Tsutsui T. Research on the children in hospital infant's homes, and status of care provided- Using patient categorization based on " Index of severity and nursing care intensity" during acute phase hospital treatment-. Review of Management and Information 2011;23(2):1-12.

42) Heisei 22 nendo kôsei rôdô shô koyô kintô jidô kateikyoku katei fukushi inin jigyô itaku jigyô, Aratana jisedai ikusei shien no tame no hôkatsuteki-ichigentekina seido no sekkei ni muketa taimu sutadi chôsa (Time study to design a comprehensive and integrated system to support the development of the next generation),2011.3

THE CONTENTS OF THIS ISSUE IS SUMMARIZED IN ENGLISH BELOW

Development of Tsutsui Total Care Code: revealing the nature and quantity of care services provided in Japan Fields of nursing care, long-term care, and childcare services

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Objectives: This paper discusses the reasons Japan decided to use a one-minute time-and-motion study as a method for measuring the quantity of care provided by care staff and to explain the little-known Tsutsui Total Care Code (T.C.C) system that was developed mainly during the implementation of the Long-Term Care Insurance System.
Method: To explain the method chosen by Japan, a review and comparison of the two conventional methods of measuring a quantity of work, the work sampling method and the time-and-motion method, are made. In addition, this paper presents the unique development process of T.C.C and the evolution of care codes that are used for the quantification of data collected in the fields of nursing care, long-term care, and childcare.
Results: Compared to other advanced countries, Japan has a relatively low amount of tax collected and social insurance premiums, and the extent to which nursing care, social care, long-term care, and childcare should be covered is a controversial topic. As an attempt to address this issue, the T.C.C system, which uses care codes to depict the range and nature of care services, was implemented and then revised many times over 24 years. This system reveals the actual situation of care provision in numerous fields.
Conclusion: Japan has succeeded in covering to a certain level the costs of medical and long-term care services through social insurance, but issues concerning the low remuneration of long-term care providers have been raised recently and are throwing discredit on the way the prices of care services are decided. This paper suggests that these issues are instead inherent to the increasingly abstract nature of many services and that the use of T.C.C could be the key to supporting the veracity of this phenomenon. In the future, to cover publicly long-term care expenses in the context of an ageing population and an expansion of care needs, sufficient evidence needs to be found when determining the prices of care services rationally. The type of knowledge presented here may be helpful when examining the remuneration of care system.

Key Words: T.C.C (Tsutsui Total Care Code), one-minute time-and-motion study, care services, codification, work sampling method and time-and-motion method.