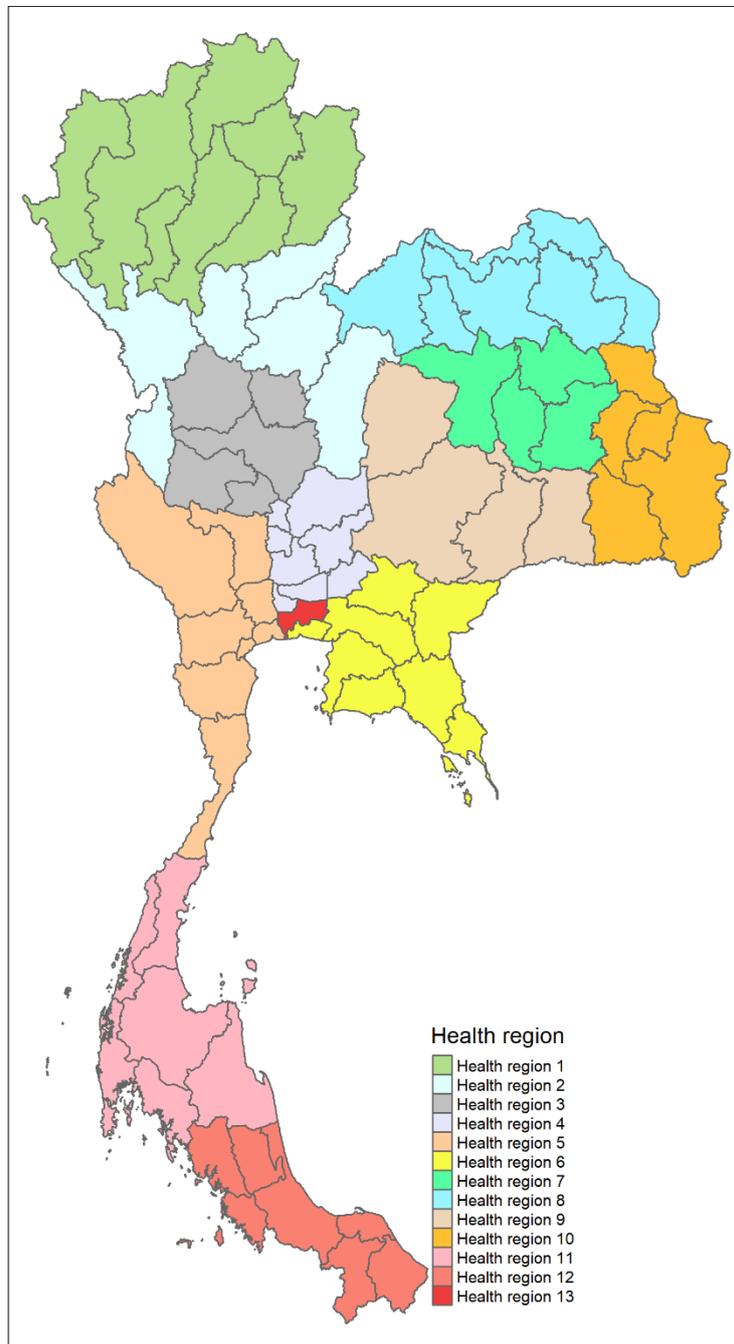


**Additional file**



**Figure S1 Map of health regions in Thailand**

**Table S1 Classification of referral hospitals and goal of stroke service delivery under Thai service plan strategy [1-3].**

Referral hospital level <sup>1</sup>	Hospital level	Level of care	Number of hospitals	Details	Stroke service based-on service plan and goals within 5 years					
					2017	2018	2019	2020	2021	2022
High-level referral hospitals	Advanced-level referral hospitals (A-level)	Tertiary care	33	<ul style="list-style-type: none"> <li>• Number of beds: more than 500 beds</li> <li>• All major medical specialists, all minor specialties and all sub-specialties.</li> <li>• It can deliver advance and sophisticate health technology and can have a function as the medical school.</li> <li>• It is able to support referral patients from regional/general hospitals<sup>2</sup> within the district or nearby areas covering 4-8 provinces per one advance-level referral hospital.</li> </ul>	26	7	-	-	-	-
High-level referral hospitals	Standard-level referral hospitals (S-level)	Tertiary care	48	<ul style="list-style-type: none"> <li>• Number of beds: more than 300 - 500 beds.</li> <li>• It is a provincial general hospital and designated as the node of the provincial network.</li> <li>• The hospital has medical specialists in all major specialties, all minor specialties and sub - specialties in some fields (as needed).</li> <li>• It is able to support referral patients in a provincial service network<sup>3</sup>.</li> </ul>	26	5	5	5	5	2
Mid-level	Mid-level referral	Tertiary care	36	<ul style="list-style-type: none"> <li>• Number of beds: more than 120 - 300 beds.</li> </ul>	-	-	Setting up stroke unit if hospitals have capacity.			

Referral hospital level <sup>1</sup>	Hospital level	Level of care	Number of hospitals	Details	Stroke service based-on service plan and goals within 5 years					
					2017	2018	2019	2020	2021	2022
referral hospitals	hospitals (M1-level)			<ul style="list-style-type: none"> <li>It is a district general hospital having medical specialists in all 6 major specialties (physician, surgeon, obstetrician, paediatrician, orthopaedist and anaesthesiologist) and some minor specialties that are required.</li> <li>It is designated as a referral hospital for patients from the secondary care in their service network.</li> </ul>						
Mid-level referral hospitals	Mid-level referral hospitals (M2-level)	Secondary care	88	<ul style="list-style-type: none"> <li>Number of beds: more than 120 - 300 beds.</li> <li>It is a big/node community hospitals having medical specialists in all 6 major specialties (physician, surgeon, obstetrician, paediatrician, orthopaedist and anaesthesiologist)</li> <li>It is designated as a referral hospital for patients from the secondary care in first-level referral hospitals.</li> </ul>	-	-	-	-	-	-
First-level referral hospital	First-level referral hospital (F-level)	Secondary care	694	<ul style="list-style-type: none"> <li>Number of beds: from 10 to more than 120 beds.</li> <li>It is a district hospital or community hospital providing the services that cover basic primary health care and secondary cares which mean that they have clinical capacity to provide admission services.</li> </ul>	-	-	-	-	-	-

Referral hospital level <sup>1</sup>	Hospital level	Level of care	Number of hospitals	Details	Stroke service based-on service plan and goals within 5 years					
					2017	2018	2019	2020	2021	2022
				<ul style="list-style-type: none"> <li>They are able to provide treatments from medical specialties in all or some fields (major specialty: obstetrics, orthopaedics, paediatrics, surgery, and medicine)</li> </ul>						
N/A	Primary health care	Primary care	N/A	<ul style="list-style-type: none"> <li>The primary health care are the smallest size and offer basic primary care services for several type of health prevention and promotion services, but not for admission services.</li> <li>They are closed to the community, village or patient's home and the distance is usually less than 30 minutes from home to primary care unit.</li> </ul>	-	-	-	-	-	-

<sup>1</sup>classification based on service plan strategy

<sup>2</sup>regional/general hospitals served as tertiary hospital level and mostly located in big provincial cities throughout Thailand.

<sup>3</sup>provincial service network defined as a network between provinces such as a seamless services for stroke fast track.

**Table S2 Number of hospitals by health region at year 2019 [4]**

<b>Health region</b>	<b>Advanced-level referral hospitals</b>	<b>Standard-level referral hospitals</b>	<b>Mid-level referral hospitals (M1-level)</b>	<b>Mid-level referral hospitals (M2-level)</b>	<b>First-level referral hospital</b>	<b>Total</b>
1	3	5	3	8	83	102
2	2	4	1	6	34	47
3	1	4		5	44	54
4	3	5	4	6	53	71
5	4	6	5	6	45	66
6	6	3	5	5	54	73
7	2	2	2	12	59	77
8	2	5	3	5	73	88
9	3	2	4	13	67	89
10	2	4	3	4	58	71
11	3	4	4	10	60	81
12	3	5	2	4	64	78
<b>Total</b>	<b>34</b>	<b>49</b>	<b>36</b>	<b>84</b>	<b>694</b>	<b>897</b>

**Table S3 Checklist for Reporting Of Survey Studies (CROSS)**

Section/topic	Item	Item description	Reported on page #
<b>Title and abstract</b>			
Title and abstract	1a	State the word “survey” along with a commonly used term in title or abstract to introduce the study’s design.	1
	1b	Provide an informative summary in the abstract, covering background, objectives, methods, findings/results, interpretation/discussion, and conclusions.	1-2
<b>Introduction</b>			
Background	2	Provide a background about the rationale of study, what has been previously done, and why this survey is needed.	2-4
Purpose/aim	3	Identify specific purposes, aims, goals, or objectives of the study.	4
<b>Methods</b>			
Study design	4	Specify the study design in the methods section with a commonly used term (e.g., cross-sectional or longitudinal).	5
	5a	Describe the questionnaire (e.g., number of sections, number of questions, number and names of instruments used).	5
Data collection methods	5b	Describe all questionnaire instruments that were used in the survey to measure particular concepts. Report target population, reported validity and reliability information, scoring/classification procedure, and reference links (if any).	5
	5c	Provide information on pretesting of the questionnaire, if performed (in the article or in an online supplement). Report the method of pretesting, number of times questionnaire was pre-tested, number and demographics of participants used for pretesting, and the level of similarity of demographics between pre-testing participants and sample population.	5
	5d	Questionnaire if possible, should be fully provided (in the article, or as appendices or as an online supplement).	Additional file 2.
Sample characteristics	6a	Describe the study population (i.e., background, locations, eligibility criteria for participant inclusion in survey, exclusion criteria).	5
	6b	Describe the sampling techniques used (e.g., single stage or multistage sampling, simple random sampling, stratified sampling, cluster sampling, convenience sampling). Specify the locations of sample participants whenever clustered sampling was applied.	5
	6c	Provide information on sample size, along with details of sample size calculation.	5
	6d	Describe how representative the sample is of the study population (or target population if possible), particularly for population-based surveys.	5
Survey administration	7a	Provide information on modes of questionnaire administration, including the type and number of contacts, the location where the survey was conducted (e.g., outpatient room or by use of online tools, such as SurveyMonkey).	5-6
	7b	Provide information of survey’s time frame, such as periods of recruitment, exposure, and follow-up days.	6 and additional file 2.
	7c	Provide information on the entry process: →For non-web-based surveys, provide approaches to minimize human error in data entry. →For web-based surveys, provide approaches to prevent “multiple participation” of participants.	5-6
Study preparation	8	Describe any preparation process before conducting the survey (e.g., interviewers’ training process, advertising the survey).	5-6

Section/topic	Item	Item description	Reported on page #
Ethical considerations	9a	Provide information on ethical approval for the survey if obtained, including informed consent, institutional review board [IRB] approval, Helsinki declaration, and good clinical practice [GCP] declaration (as appropriate).	6 and additional file 2
	9b	Provide information about survey anonymity and confidentiality and describe what mechanisms were used to protect unauthorized access.	additional file 2
Statistical analysis	10a	Describe statistical methods and analytical approach. Report the statistical software that was used for data analysis.	6
	10b	Report any modification of variables used in the analysis, along with reference (if available).	n/a
	10c	Report details about how missing data was handled. Include rate of missing items, missing data mechanism (i.e., missing completely at random [MCAR], missing at random [MAR] or missing not at random [MNAR]) and methods used to deal with missing data (e.g., multiple imputation).	n/a
	10d	State how non-response error was addressed.	n/a
	10e	For longitudinal surveys, state how loss to follow-up was addressed.	n/a
	10f	Indicate whether any methods such as weighting of items or propensity scores have been used to adjust for non-representativeness of the sample.	n/a
	10g	Describe any sensitivity analysis conducted.	n/a
<b>Results</b>			
Respondent characteristics	11a	Report numbers of individuals at each stage of the study. Consider using a flow diagram, if possible.	6
	11b	Provide reasons for non-participation at each stage, if possible.	n/a
	11c	Report response rate, present the definition of response rate or the formula used to calculate response rate.	6
	11d	Provide information to define how unique visitors are determined. Report number of unique visitors along with relevant proportions (e.g., view proportion, participation proportion, completion proportion).	n/a
Descriptive results	12	Provide characteristics of study participants, as well as information on potential confounders and assessed outcomes.	6
Main findings	13a	Give unadjusted estimates and, if applicable, confounder-adjusted estimates along with 95% confidence intervals and p-values.	n/a
	13b	For multivariable analysis, provide information on the model building process, model fit statistics, and model assumptions (as appropriate).	n/a
	13c	Provide details about any sensitivity analysis performed. If there are considerable amount of missing data, report sensitivity analyses comparing the results of complete cases with that of the imputed dataset (if possible).	n/a
<b>Discussion</b>			
Limitations	14	Discuss the limitations of the study, considering sources of potential biases and imprecisions, such as non-representativeness of sample, study design, important uncontrolled confounders.	17
Interpretations	15	Give a cautious overall interpretation of results, based on potential biases and imprecisions and suggest areas for future research.	17
Generalizability	16	Discuss the external validity of the results.	17
<b>Other sections</b>			

<b>Section/topic</b>	<b>Item</b>	<b>Item description</b>	<b>Reported on page #</b>
Role of funding source	17	State whether any funding organization has had any roles in the survey's design, implementation, and analysis.	18
Conflict of interest	18	Declare any potential conflict of interest.	18
Acknowledgements	19	Provide names of organizations/persons that are acknowledged along with their contribution to the research.	19

## **Questionnaire administration**

### **1. Questionnaire development**

The service level data of each hospital were collected using the developed questionnaires. The INTERSTROKE questionnaire [5] was adapted by all authors (PL was an author for the INTERSTROKE questionnaire) before translating to Thai language. Adaptations were made to reflect the Thai context.

Questionnaire contained six parts as namely (1) hospital characteristics (e.g. hospital level, beds, number of staff), (2) healthcare service funding (e.g. sources of fund), (3) stroke unit characteristics (e.g. beds in stroke unit, type and the number of staff providing care, proportion of stroke patients, multidisciplinary team meetings), (4) other facilities and services related to stroke services (e.g. their own written guidance, type of clinical assessment scores, systems of complication prevention), (5) post-stroke care (e.g. type of rehabilitation provided, type of staff) and (6) in suggestions and feedback for stroke service delivery improvement.

### **2. Stroke questionnaire adapted from the INTERSTROKE study**

It should be noted that this questionnaire version (Figure S2) has been adapted to Thai language. The Thai questionnaire version was submitted and granted by the Ethical Review Committee of the Institute for Development of Human Research Protection, MOPH (No.IHRP722/2562) prior to conducting this study.

### Stroke service questionnaire

We would like to collect the description of the type of service and care that the majority of stroke patients will receive at your centre. Please put **X** mark in the box  in front of the statement and/or fill in the blank truthfully. If there is no service available, please enter/fill 0.

A. Hospital Characteristics			
A1	Province		
A2	Hospital name		
A3	Hospital level	<input type="checkbox"/> A <input type="checkbox"/> S <input type="checkbox"/> M1 <input type="checkbox"/> Other (specify) .....	
A4	Area health		
A5	How many beds are in your hospital?	In total	<input type="text"/>
		In medicine departments (i.e. non-surgery)	<input type="text"/>
		Dedicated for stroke patients	<input type="text"/>
A6	How many physicians are in your hospital?	In total	<input type="text"/>
		General practice	<input type="text"/>
		Internal medicine	<input type="text"/>
		Neurologist	<input type="text"/>
		Certificate in Fellowship Training in Stroke Surgeon	<input type="text"/>
		Neurosurgeon	<input type="text"/>
		Emergency medicine	<input type="text"/>
		Radiologist/ Interventional radiologist	<input type="text"/>
		Rehabilitation physician	<input type="text"/>
		Family medicine	<input type="text"/>
Other (specify)	<input type="text"/>		
A7	On average, how many stroke patients are admitted to your hospital each year?	In total (ICD10: I60-I69)	<input type="text"/>
		Ischemic stroke (ICD10: I63)	<input type="text"/>
		Haemorrhagic stroke (ICD10: I60-I62)	<input type="text"/>
		Unspecified stroke (ICD10: I64-I69)	<input type="text"/>
A8	On average, how many stroke patients are transferred to other hospitals each year?	In total (ICD10: I60-I69)	<input type="text"/>
		Ischemic stroke (ICD10: I63)	<input type="text"/>
		Haemorrhagic stroke (ICD10: I60-I62)	<input type="text"/>
		Unspecified stroke (ICD10: I64-I69)	<input type="text"/>
A9	What number of stroke patients are usually in your hospital at any one time?	Approximate number (cases)	<input type="text"/>

A. Hospital Characteristics					
A10	Which of the following departments are usually involved in providing care for stroke patients during their acute illness? (Tick all that apply)	<input type="checkbox"/> General (internal) medicine <input type="checkbox"/> Neurology <input type="checkbox"/> Surgery <input type="checkbox"/> Rehabilitation <input type="checkbox"/> General practice / Family medicine <input type="checkbox"/> Nursing <input type="checkbox"/> Pharmacy <input type="checkbox"/> Other (specify) _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
A11	What proportion of stroke patients are looked after by a specialist doctor training in stroke?	approximate proportion (%)	<input type="text"/>		
A12	Does your hospital have your own stroke registry?	<input type="checkbox"/> Yes <input type="checkbox"/> No			
A13	Does your hospital have any network with other hospitals and which hospital is the main hub?	<input type="checkbox"/> Yes, having stroke fast track	Hospital hub name: _____ <input type="checkbox"/> No		
		<input type="checkbox"/> Yes, having referral system	Hospital hub name: _____ <input type="checkbox"/> No		
B. Healthcare service funding					
B1	What proportion (%) of source of fund for stroke services?	Services	Government funding	Private funding	Other (specify)
		Medical services			
		Medicine (i.e. rt-PA drug)			
		Investigation (i.e. CT scanning, MRI, lab test)			
		Rehabilitation programme			
		Material and equipment			
		Education programme			
	Other (specify) _____				
B2	Which items would the patient have to pay for?	<input type="checkbox"/> Medical services <input type="checkbox"/> Medicines <input type="checkbox"/> Medical equipment <input type="checkbox"/> Other (specify) _____	<input type="checkbox"/> Investigations (e.g. CT scanning, MRI) <input type="checkbox"/> Therapy (e.g. physiotherapy) <input type="checkbox"/> None of the above/Free-of-charge		
C. Stroke unit services					
C1	Does your hospital have a Stroke Unit/corner?	Stroke Unit	<input type="checkbox"/> Yes (Go to C2)	<input type="checkbox"/> No (Go to C7)	
		Stroke corner	<input type="checkbox"/> Yes (Go to C2)	<input type="checkbox"/> No (Go to C7)	
C2	How many beds are in your stroke unit/corner?	Number of beds in stroke unit	<input type="text"/>		
		Number of beds in stroke corner	<input type="text"/>		
C3	What proportion (%) of stroke patients are usually admitted to stroke unit/corner?	approximate proportion (%)	<input type="text"/>		

C. Stroke unit services																																																																															
C4	Which of these features describe your stroke unit?	<input type="checkbox"/> Discrete ward area for stroke patients <input type="checkbox"/> Physicians and/or nurses whose work is mainly managing stroke patients <input type="checkbox"/> Multidisciplinary team with main responsibility in managing stroke patients <input type="checkbox"/> Special education programmes provided for stroke unit staff <input type="checkbox"/> Information and education for stroke patients and their families or caregivers <input type="checkbox"/> Written standard protocols for stroke management (i.e. a written management care plan) <input type="checkbox"/> Other (specify) _____																																																																													
C5	Does your hospital receive a stroke centre certification?	<input type="checkbox"/> Yes <input type="checkbox"/> No																																																																													
C6	Which of the following staffs and number of staff are usually involved in providing care for stroke patients in stroke unit?	<table border="1"> <thead> <tr> <th>Type of staff</th> <th>Approx. number of staffs in stroke unit</th> <th>Number of part-time staffs</th> <th>Number of full-time staffs</th> </tr> </thead> <tbody> <tr><td>General practice</td><td></td><td></td><td></td></tr> <tr><td>Internal medicine</td><td></td><td></td><td></td></tr> <tr><td>Neurology</td><td></td><td></td><td></td></tr> <tr><td>Certificate in fellowship training in stroke</td><td></td><td></td><td></td></tr> <tr><td>Surgery</td><td></td><td></td><td></td></tr> <tr><td>Neurosurgery</td><td></td><td></td><td></td></tr> <tr><td>Emergency medicine</td><td></td><td></td><td></td></tr> <tr><td>Radiology/ Interventional radiology</td><td></td><td></td><td></td></tr> <tr><td>Rehabilitation physician</td><td></td><td></td><td></td></tr> <tr><td>Family medicine</td><td></td><td></td><td></td></tr> <tr><td>Nurse</td><td></td><td></td><td></td></tr> <tr><td>Pharmacist</td><td></td><td></td><td></td></tr> <tr><td>Physiotherapist</td><td></td><td></td><td></td></tr> <tr><td>Occupational therapist</td><td></td><td></td><td></td></tr> <tr><td>Speech-Language therapist</td><td></td><td></td><td></td></tr> <tr><td>Psychologist</td><td></td><td></td><td></td></tr> <tr><td>Social worker</td><td></td><td></td><td></td></tr> <tr><td>Other (specify)</td><td></td><td></td><td></td></tr> </tbody> </table>	Type of staff	Approx. number of staffs in stroke unit	Number of part-time staffs	Number of full-time staffs	General practice				Internal medicine				Neurology				Certificate in fellowship training in stroke				Surgery				Neurosurgery				Emergency medicine				Radiology/ Interventional radiology				Rehabilitation physician				Family medicine				Nurse				Pharmacist				Physiotherapist				Occupational therapist				Speech-Language therapist				Psychologist				Social worker				Other (specify)				
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C. Stroke unit services																																									
C7	<p>Do you have a multidisciplinary team (medical, nursing, pharmacy, therapy staff) who meet on a regular basis to plan patient management?</p> <p><input type="checkbox"/> Yes, meeting once per day  <input type="checkbox"/> Yes, meeting once per week  <input type="checkbox"/> Yes, meeting less than once per week (specify) _____  <input type="checkbox"/> No multidisciplinary team</p>																																								
C8	<p>After initial acute treatment, where do patients usually receive continuing rehabilitation in hospital?</p> <p><input type="checkbox"/> Yes, in general medical or neurology wards  <input type="checkbox"/> Yes, in the stroke unit  <input type="checkbox"/> Yes, transfer to another hospitals (higher level)  <input type="checkbox"/> Yes, transfer to another hospitals (lower level)  <input type="checkbox"/> No continuing rehabilitation available  <input type="checkbox"/> Other (specify) _____</p>																																								
C9	<table border="1"> <thead> <tr> <th>Staff</th> <th>Government funded</th> <th>Privately funded</th> <th>Other (specify)</th> </tr> </thead> <tbody> <tr><td>Doctors</td><td></td><td></td><td></td></tr> <tr><td>Nurses</td><td></td><td></td><td></td></tr> <tr><td>Physiotherapists</td><td></td><td></td><td></td></tr> <tr><td>Occupational therapists</td><td></td><td></td><td></td></tr> <tr><td>Speech therapists</td><td></td><td></td><td></td></tr> <tr><td>Psychologists</td><td></td><td></td><td></td></tr> <tr><td>Village Health Volunteer</td><td></td><td></td><td></td></tr> <tr><td>Family members</td><td>-----</td><td></td><td></td></tr> <tr><td>Other (specify) _____</td><td></td><td></td><td></td></tr> </tbody> </table>	Staff	Government funded	Privately funded	Other (specify)	Doctors				Nurses				Physiotherapists				Occupational therapists				Speech therapists				Psychologists				Village Health Volunteer				Family members	-----			Other (specify) _____			
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C10	<p>Are the patient or family members / care givers usually educated in rehabilitation?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No (Go to D1)</p>																																								
C11	<table border="0"> <tr> <td><input type="checkbox"/> Doctors</td> <td><input type="checkbox"/> Nurses</td> </tr> <tr> <td><input type="checkbox"/> Physiotherapists</td> <td><input type="checkbox"/> Occupational therapists</td> </tr> <tr> <td><input type="checkbox"/> Psychologists</td> <td><input type="checkbox"/> Speech therapists</td> </tr> <tr> <td><input type="checkbox"/> Village Health Volunteer</td> <td><input type="checkbox"/> Other (specify) _____</td> </tr> </table>	<input type="checkbox"/> Doctors	<input type="checkbox"/> Nurses	<input type="checkbox"/> Physiotherapists	<input type="checkbox"/> Occupational therapists	<input type="checkbox"/> Psychologists	<input type="checkbox"/> Speech therapists	<input type="checkbox"/> Village Health Volunteer	<input type="checkbox"/> Other (specify) _____																																
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D. Other facilities and services																																									
D1	<p>Do you have a written guidance for stroke management (i.e. a written management care plan) for hospital staffs?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No (Go to D4)</p>																																								
D2	<p>Which of the topics are included in your guidance?</p> <p>Please list any items/topics included in your hospital protocols (e.g. assessment of swallowing impairment, early mobilisation, prevention of complications)</p>																																								

D. Other facilities and services					
D3	Can you provide written copies of the guidance if requested?	<input type="checkbox"/> Yes <input type="checkbox"/> No			
D4	Which and when of these clinical assessment scores does your hospital uses for evaluating stroke patients? And where do you record these data (i.e. electronic database, OPD card)?	Admission	Discharge	Recorded location	Clinical assessment Glasgow coma scales Barthel Index modified Rankin Score National Institutes of Health Stroke Scale Swallowing impairment Level of consciousness Malnutrition Other (specify) _____
D5	Which and when of these laboratory investigations does your hospital uses for investigating stroke patients? And where do you record these data (i.e. electronic database, OPD card)?	Admission	Discharge	Recorded location	Laboratory
					Blood sugar
					HbA1C
					CBC
					INR
					Creatinine
					EGFR
					Total cholesterol
					LDL
					HDL
			Triglyceride		
			Other (specify) _____		
D6	Which of these medications are provided and what proportion (%) of stroke patients are usually received each drug?	Medications			Approximate proportion (%)
		Recombinant tissue plasminogen activator (rt-PA)			
		Antiplatelet (i.e. aspirin, ticlopidine, clopidogrel, aspirin + dipyridamole)			
		Anticoagulant (i.e. warfarin, dabigatran, apixaban, rivaroxaban)			
D7	If you have a rt-PA drug, which route of rt-PA is prescribed?	<input type="checkbox"/> Intravenous <input type="checkbox"/> Intra-arterial <input type="checkbox"/> Other (specify) _____			
D8	Which investigations and what proportion (%) of stroke patients are usually received within 24 hours after admission in your hospital?	Investigations			Approximate proportion (%)
		Elektrokardiogram (EKG) monitor			
		Computerized Tomography (CT) brain			
		Magnetic Resonance Imaging (MRI)/Angiography (MRA)			
		Carotid Doppler ultrasound			
		Other (specify) _____			

D. Other facilities and services		
D9	Does your hospital can perform an endovascular treatment (thrombectomy) in acute stroke?	<input type="checkbox"/> Yes <input type="checkbox"/> No
D10	Do you have a prevention of complications written plans/protocols?	<input type="checkbox"/> Yes <input type="checkbox"/> No

E. Post-stroke care																		
E1	Does your hospital have a post-rehabilitation unit?	<input type="checkbox"/> Yes <input type="checkbox"/> No																
E2	Which type of medical rehabilitation services are provided and what proportion of stroke patients are received this service?	<table border="1"> <thead> <tr> <th>Rehabilitation services</th> <th>approximate proportion (%)</th> </tr> </thead> <tbody> <tr> <td>Acute/Inpatient rehabilitation</td> <td></td> </tr> <tr> <td>Outpatient rehabilitation</td> <td></td> </tr> <tr> <td>Post-acute rehabilitation</td> <td></td> </tr> <tr> <td>Home-based rehabilitation</td> <td></td> </tr> <tr> <td>Community-based rehabilitation</td> <td></td> </tr> <tr> <td>Others (specify) _____</td> <td></td> </tr> </tbody> </table>	Rehabilitation services	approximate proportion (%)	Acute/Inpatient rehabilitation		Outpatient rehabilitation		Post-acute rehabilitation		Home-based rehabilitation		Community-based rehabilitation		Others (specify) _____			
Rehabilitation services	approximate proportion (%)																	
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Outpatient rehabilitation																		
Post-acute rehabilitation																		
Home-based rehabilitation																		
Community-based rehabilitation																		
Others (specify) _____																		
E3	Do you have a follow-up system after patient discharge from hospital?	<input type="checkbox"/> Yes <input type="checkbox"/> No																
E4	Which type of home health care services are provided for stroke patients?	<table border="1"> <tbody> <tr> <td><input type="checkbox"/> GP / Internal medicine</td> <td><input type="checkbox"/> Neurologist / Certificate in fellowship training in stroke</td> </tr> <tr> <td><input type="checkbox"/> Family medicine</td> <td><input type="checkbox"/> Emergency medicine</td> </tr> <tr> <td><input type="checkbox"/> Rehabilitation physician</td> <td><input type="checkbox"/> Nurse</td> </tr> <tr> <td><input type="checkbox"/> Pharmacist</td> <td><input type="checkbox"/> Psychologists</td> </tr> <tr> <td><input type="checkbox"/> Physiotherapist</td> <td><input type="checkbox"/> Occupational therapist</td> </tr> <tr> <td><input type="checkbox"/> Speech-language pathologist</td> <td><input type="checkbox"/> Nutritionist</td> </tr> <tr> <td><input type="checkbox"/> Village Health Volunteer</td> <td><input type="checkbox"/> Social Medicine</td> </tr> <tr> <td><input type="checkbox"/> Thai Traditional Medicine</td> <td><input type="checkbox"/> Others (specify) _____</td> </tr> </tbody> </table>	<input type="checkbox"/> GP / Internal medicine	<input type="checkbox"/> Neurologist / Certificate in fellowship training in stroke	<input type="checkbox"/> Family medicine	<input type="checkbox"/> Emergency medicine	<input type="checkbox"/> Rehabilitation physician	<input type="checkbox"/> Nurse	<input type="checkbox"/> Pharmacist	<input type="checkbox"/> Psychologists	<input type="checkbox"/> Physiotherapist	<input type="checkbox"/> Occupational therapist	<input type="checkbox"/> Speech-language pathologist	<input type="checkbox"/> Nutritionist	<input type="checkbox"/> Village Health Volunteer	<input type="checkbox"/> Social Medicine	<input type="checkbox"/> Thai Traditional Medicine	<input type="checkbox"/> Others (specify) _____
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<input type="checkbox"/> Village Health Volunteer	<input type="checkbox"/> Social Medicine																	
<input type="checkbox"/> Thai Traditional Medicine	<input type="checkbox"/> Others (specify) _____																	
E5	Does your hospital have an intermediate care service (IMC) and long-term care (LTC) service?	<table border="1"> <tbody> <tr> <td>IMC</td> <td><input type="checkbox"/> Yes <input type="checkbox"/> No</td> </tr> <tr> <td>LTC</td> <td><input type="checkbox"/> Yes <input type="checkbox"/> No</td> </tr> </tbody> </table>	IMC	<input type="checkbox"/> Yes <input type="checkbox"/> No	LTC	<input type="checkbox"/> Yes <input type="checkbox"/> No												
IMC	<input type="checkbox"/> Yes <input type="checkbox"/> No																	
LTC	<input type="checkbox"/> Yes <input type="checkbox"/> No																	

Further comments

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**THANK YOU VERY MUCH**

Please return the questionnaire via email: 2425416K@student.gla.ac.uk

Date of completing questionnaire \_\_\_/\_\_\_/\_\_\_

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**Figure S2 Stroke questionnaire adapted from the INTERSTROKE study**

### **3. Pilot test and revision**

Before circulating the questionnaire, it was reviewed by two non-academic healthcare staff from hospitals (neurologists) and one academic staff member. After revision, a pilot questionnaire was sent to four secondary hospitals to help ensure their understanding and ability to complete the questions. Finally, the questionnaire sentences/wording was revised based on their comments.

### **4. Ethical consideration**

The questionnaire and related documents such as inform consent, definition, research summary, ethical approval certificate, were presented in Thai language and this study was submitted and granted by the Ethical Review Committee of the Institute for Development of Human Research Protection, MOPH (No.IHRP722/2562) prior to conducting this study. All research was performed in accordance with the declaration of Helsinki ethical principles. Ethical approval was granted for public hospitals under the Thai MOPH (12 health regions).

### **5. Questionnaire distribution and administration**

Prior questionnaire distribution, the author performed a telephone call to ask for key managerial health professionals - health professionals who work or have main responsibility related to stroke service provision in their hospital to be the respondents/coordinators. For example, nurse case manager, neurologist. Then, a brief introduction of this study was presented and asked if they could provide their contact information such as telephone number or email. Next, the self-completed questionnaire were distributed via e-mail (PDF-fillable form questionnaire), online-questionnaire (using paid web-based survey), paper questionnaire (by post). Telephone calls were offered if clarification was required by respondents. Online-questionnaires were created using SurveyGizmo® website (collaborator license). The full-set of online-questionnaire was available at <https://sgiz.eu/s3/Stroke-TH>.

When participants answered in paper questionnaire format, a free business-reply return envelope were included when sending a post to hospitals. In terms of online questionnaire, the questionnaire answers were recorded electronically. Data from the online-questionnaire were then exported into a Microsoft Excel file format with coded responses. The author combined both answers from paper and online questionnaires, then checking for consistency and made a telephone call back to the respondents if there were some errors or needed a confirmation or clarification. Data were entered or exported into Microsoft Excel spreadsheets before being transferred to R for analysis.

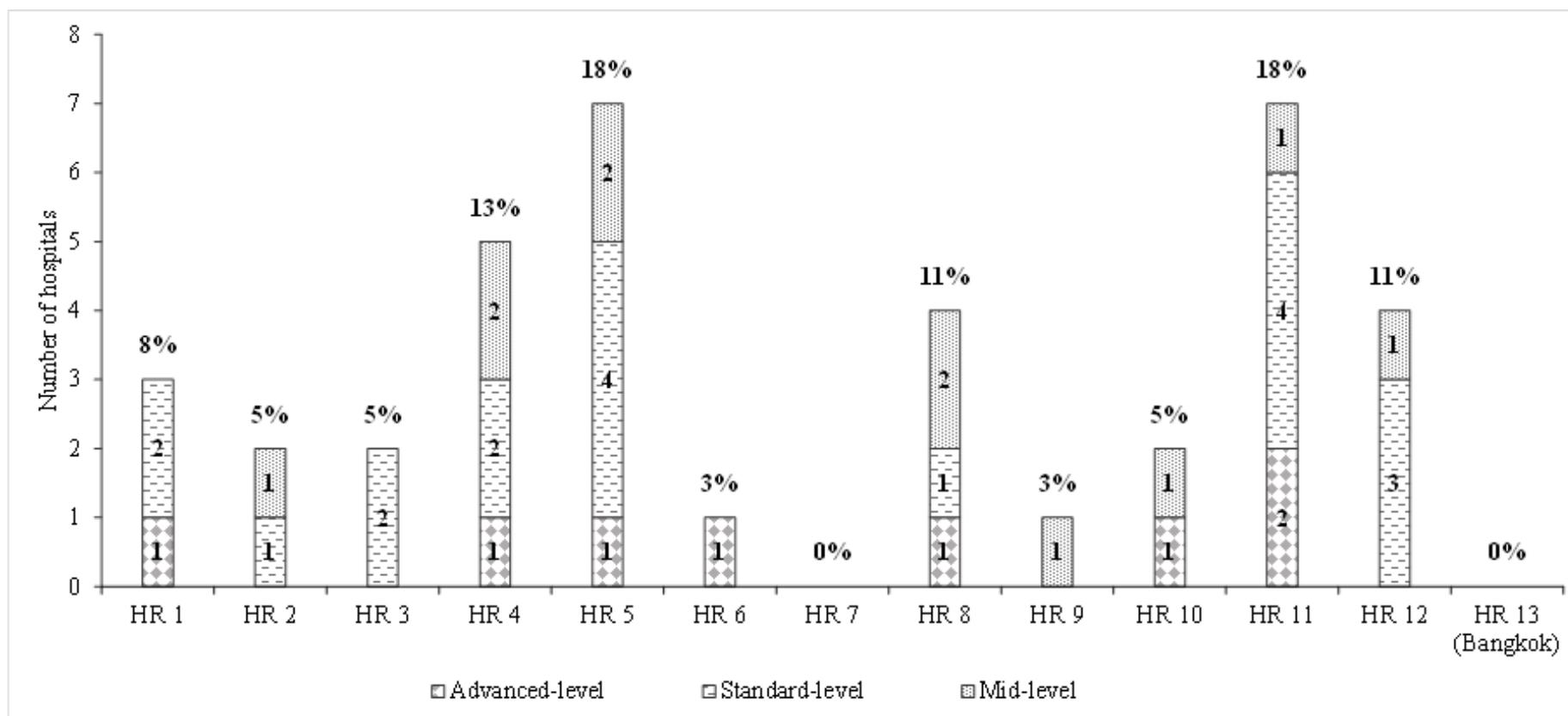
### **6. Data collection**

Table S4 shows the timeline of data collection procedure, after distributing the self-reported questionnaire (day 0), researcher informed the respondents by e-mail or telephone within 7-14 days to confirm whether letter to hospital director, questionnaire and related documents were received and registered into their systems. A one-month follow-up asked whether participants had received all related documents. Then, researcher waited for 4 weeks

and confirm whether they had received and completed it, afterwards, e-mail was resent and telephone calls and social applications were made with the option to complete the questionnaire by using telephone interview to increase the response rate. Next, telephone calls and email were performed every two weeks for reminding and stimulating the respondents. Subsequently, the author started analysing data within month 5th and 6th months. Finally, this study was closed at month seven. Data were collected for the fiscal year 2018 (1 October 2017 - 30 September 2018). First author (SK) collected and managed for survey anonymity and confidentiality of these data. A 10% of records was randomly selected for double check by one co-author (CG).

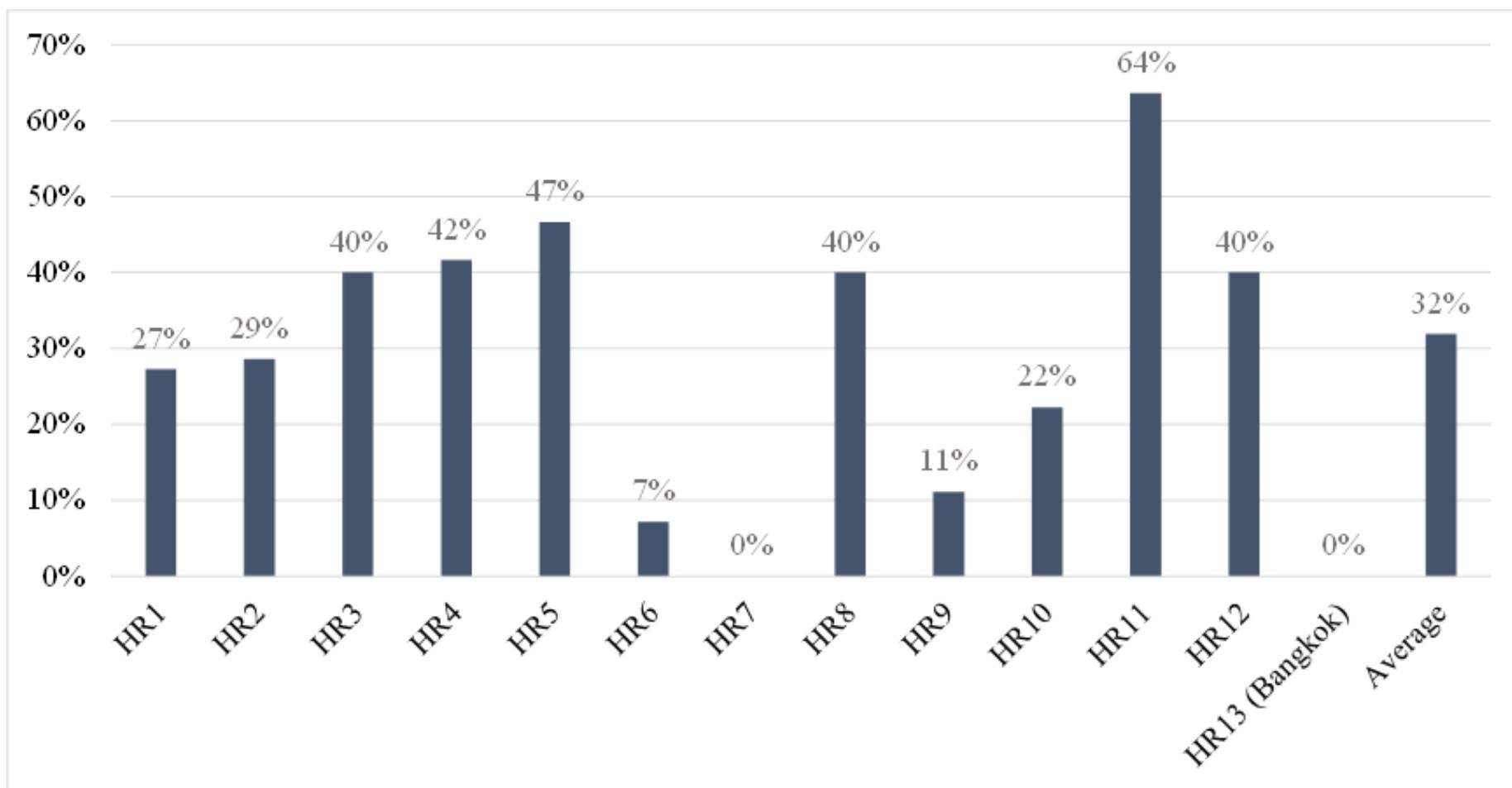
**Table S4 Data collection timeline**

<b>Period</b>	<b>Date</b>	<b>Detail</b>
Day 0	1-Nov-2019	Distribution of the self-reported questionnaire to all hospitals by post and online questionnaire channels.
Day 7-14	15-Nov-2019	- Telephone call to a confirmation whether questionnaire was registered into the hospital systems and whether the participants received questionnaire. - Distribution of the self-reported questionnaire by E-mail to coordinator/respondents who had already received a permission from their hospital directors.
Day 30	30-Nov-2019	Telephone call to a confirmation whether the participants received questionnaire and had completed it
Day 31-60	30-Dec-2019	- Data collection and data confirmation - A follow-up email was sent and a telephone call for reminding and stimulating the respondents
Every 2 weeks		- Data collection and data confirmation - A follow-up email was sent and a telephone call for reminding and stimulating the respondents
Month 5 <sup>th</sup>	30-Mar-2020	- Data collection (extending due to Coronavirus-19 outbreak)
Month 6 <sup>th</sup>	30-Apr-2020	- Data collection - Data management and analysis
Month 7 <sup>th</sup>	30-May-2020	- Study closed - Data management and analysis



**Figure S3 Number of questionnaires received and proportion of questionnaires (N=38)**

Advanced-level: Advanced-level referral hospitals, HR: Health region, Mid: Mid-level referral hospitals (M1-level), Standard-level: Standard-level referral hospitals



**Figure S4 Response rate, by health region (N=38)**

HR: health region

**Table S5 Type and number of staff providing care for stroke patients in stroke unit/stroke corner**

Type of staff		Advanced-level referral hospitals (N=6)			Standard-level referral hospitals (N=17)			Mid-level referral hospitals (N=10)		
		All	FT	PT	All	FT	PT	All	FT	PT
Internal medicine	N	3	3	-	14	9	6	10	8	3
	Median (IQR)	4 (5)	4 (5)	-	2 (4)	4 (5)	1 (-)	4 (3)	2 (3)	5 (1)
	min-max	1-12	1-12	-	1-7	1-7	1-2	1-7	1-5	4-6
Neurology	N	6	5	1	5	3	2	-	-	-
	Median (IQR)	2 (2)	1 (2)	2	1	1	1	-	-	-
	min-max	1-3	1-3	-	1	1	1	-	-	-
Neurosurgery	N	6	2	4	8	3	5	1	-	1
	Median (IQR)	3 (1)	2 (1)	3 (-)	1 (-)	2 (-)	1 (1)	1	-	1
	min-max	1-4	1-2	3-4	1-2	1-2	1-2	-	-	-
Radiology	N	3	1	2	8	5	3	7	5	2
	Median (IQR)	5 (4)	1	7 (1)	2 (1)	2 (1)	2 (1)	2 (1)	2 (1)	2
	min-max	1-8	-	5-8	1-3	1-2	1-3	1-2	1-2	-
Rehabilitation physician	N	5	3	3	13	7	6	4	3	1
	Median (IQR)	2 (2)	1 (2)	1 (1)	1 (1)	1 (1)	1 (1)	1 (1)	1 (1)	1
	min-max	1-5	1-5	1-2	1-2	1-1	1-1	1-1	1-1	-
Nurse	N	6	5	2	16	14	3	9	9	1
	Median (IQR)	13 (8)	10 (8)	13 (9)	8 (6)	8 (7)	8 (8)	8 (5)	8 (5)	2
	min-max	7-22	7-18	3-22	2-20	2-15	4-19	3-18	1-18	-
Physiotherapist	N	6	5	1	14	7	8	10	8	3
	Median (IQR)	1 (1)	1 (1)	2	1 (2)	1 (2)	2 (2)	4 (3)	3 (2)	5 (3)
	min-max	1-2	1-2	-	1-7	1-7	1-7	1-6	1-6	1-6

Type of staff		Advanced-level referral hospitals (N=6)			Standard-level referral hospitals (N=17)			Mid-level referral hospitals (N=10)		
		All	FT	PT	All	FT	PT	All	FT	PT
Social worker	N	4	3	1	11	2	9	9	6	3
	Median (IQR)	1	1	1	1	1	1	1	1	1
	min-max	1	1	-	1-2	1	1-2	1-2	1-2	1

FT: full time staff, N: Number of hospitals, PT: part time staff, IQR: inter quartile range

All: Approx. number of all staff; Full-time staff: staffs who provide care for stroke patients in stroke unit/stroke corner at least 40 hours per week; Part-time staff: staffs who provide care for stroke patients in stroke unit/stroke corner less than 40 hours per week.

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