Community-Based Disaster Health Management and Social Capital in Indonesia

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Abstract：Development of emergency medical management is the one of crucial issues that needs to be addressed . Indonesa has primary health centers which are called 'Puskesmas' in each sub-district. This article examines the needs for Puskesmas and social capital among communities to identify Puskesmas' potential to provide disaster medicine and care. Trust and satisfaction on Puskesmas among communities was not so high, and social capital among communities was high in terms of 'trust' and 'morality' ; however, it is not strong for 'network' such as participation in local organizations and events. Results indicated that trust in Puskesmas has relevance to social capital in community.

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Key words：Community, Puskesmas, Disaster Management, Social Capital, Indonesia

1. Introduction

A massive earthquake with the magnitude of 6.4 struck near Yogyakaruta in Indonesia on 2006 May 27th, claiming at least 5,700 lives and injuring more than 78,000 people, mostly due to the suffocation as a result of the collapse of brick constructions. Approximately, 600,000 homes were destroyed and many people have lost their houses.

In community hospitals, patients who were suspected to have head trauma and spinal damage were sent to tertiary hospitals. However, little collaboration was found between Puskesmas and other health facilities. Indonesia has a health system wherein health centers called Puskesmas provide health service in primary level and it is established in each district. For local residents, Puskesmas was the most accessible health facilities when the natural disaster occurred. However, it was difficult to provide medical service and care for people because most of medical equipment as well as lifelines were damaged. Development of emergency medicine for natural disaster is a crucial issue that needs to be addressed in Indonesia. This article investigates the needs for Puskesmas and social capital among communities to identify Puskesmas' potential to provide disaster medicine and care.

2. Disaster Mitigation and Social Capital

In order to establish safe and disaster-resilient local communities, it is important for each resident to approach community safety with awareness of voluntary disaster management, and to acquire basic knowledge so that they can respond appropriately to emergencies. This should be reinforced with a mechanism for local residents, businesses and facilities to coordinate and cooperate in implementing disaster management activities. At the time of any major disaster, lifelines such as communications, road networks and utilities facilities for electricity, gas and water supplies are prone to be disrupted, thereby hampering fire-fighting and other operations by disaster-control organizations. In readiness for such situations, local

residents must coordinate and cooperate in establishing a disaster management system for each community.

In the Great Hanshin & Awaji Earthquake, there were many cases wherein local residents mutually cooperated to execute initial fire-fighting efforts to contain the spread of fire, or the residents undertook rescue operations to save a number of human lives. This experience reconfirmed the importance of community-based disaster control initiatives.

When a disaster strikes, it becomes necessary to implement disaster management initiatives, such as preventing fire, conducting initial fire-fighting, gathering/transmitting information, guiding evacuation, rescuing/providing shelter to affected people, providing first-aid and supplying food and water. Such initiatives cannot be implemented effectively or systematically unless each community sets up a voluntary disaster control unit, and makes day-to-day efforts to achieve disaster-readiness (e.g. developing systems for information gathering or evacuation, and stockpiling disaster-management supplies and equipment) and conducts disaster drills on the scenario of a large-scale disaster. The sense of solidarity that emerges from local communities through these activities will prove to be highly useful at the time of disasters.

As explained thus far, public safety, disaster management, and other functions of community security can only be fulfilled through collaboration among numerous individuals, civic organizations, businesses and local authorities. For this reason, local communities are now expected to function as a communication venue that binds together a large number of entities with distinctively different characteristics. The concept of "social capital", which closely relates to community members' resource structures, objectives, as well as community characteristics and policies, is emerging as the driving force for such community development.

Social capital is a concept that "trust", "moral", "network" and other elements of human mentality and individual / group association serve as "capital" for enhancing social efficiency. A study by U.S. political scientist R. D. Putnam sparked strong interest in the concept among many researchers in the 1990s. According to Putnam, et al., society rich in social capital encourages people to act in coordination, and works in higher efficiency, while public participation in social activities reinforces social capital. He cites three approaches in categorizing social capital, i.e. (1) thick ties or thin ties, (2) inward-looking or outward-looking and (3) bonding (internal ties) or bridging (external ties) (See Table 1). Bonding social capital represents homogenous bonds among group members, and generates trust, cooperation and solidarity within the group. Bridging social capital, on the other hand, represents social networks between socially heterogeneous individuals and groups. Thin and broad ties are considered more important than thick and close ties in the formation of civil society. There should be greater outward-looking interest in making public contributions, rather than inward-looking interest in member benefits within the group, and bridging social capital is more desirable than bonding social capital.

Community groups for disaster management, community organizations, various volunteer-style civic groups and other citizens' networks themselves are believed to be the outcome as well as the source of the formation of "social capital."

Nature	Bonding (e.g. ethnic network)	Bridging (e.g. environmental groups)
Extent	Thick (e.g. family ties)	Thin (e.g. acknowledgement to a stranger)
Orientation	Inward looking (e.g. chamber of commerce and industry)	Outward Looking (e.g. Red Cross)

Table 1: Categorization of social capital by Putnam

3. Primary Health , Puskeamas in Indonesia

Indonesia has an extensive primary health care system (Figure 1). Each sub-district has at least one community health center, or Puskesmas (Pusat Kesehatan Masyarakat). In the year 2003, 7,750 Puskesmas, 22,002 Puskesmas Pembantu (Sub-health centre) and 6579 Mobile or Floting Health Centers were available in Indonesia. Puskesmas is linked to a series of sub-health centers called Puskesmas pembantu and community –level health stations called Pos Pelayanan Terpadu (Posyandu). Each Puskesmas provides primary health care to 30,000 community members/inhabitants and supervises 30-50 Posyandu. It is supported by 3-4 sub-health centers and a mobile unit as Mobile Health Center or boat unit as Floating Health Center.

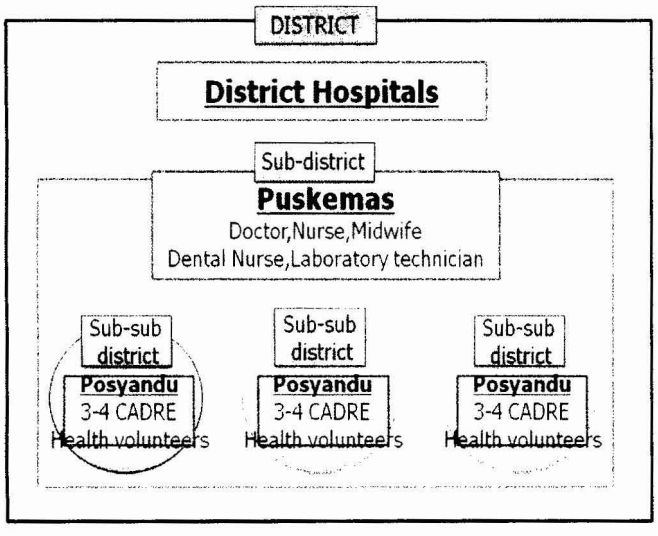

Figure1; Health system in Indonesia

The basic programs as primary health care through Puskesmas include health promotion, nutrition, mother and child health, eradication of infectious diseases, healthy environment, health information system, school health services, and family planning and health services in general. The staffing of each Puskesmas consists of 1-2 physicians and a team of 8-10 paramedics/nurses as medical support staff. In some health centers, there are beds available for in-patients.

On December 16, 2006, MOH announced plans to introduce a nationwide program to make villages self-sufficient in providing health care services and disaster relief. Under the program, each village will have at least one health center (Poskesdes) and one community development program (Gerbangmas). The program will encourage the village to conduct simple surveillance of contagious disease; provide basic medical and disaster relief services; promote health, nutrition and sanitation; and supply health alerts for emerging disease outbreak.

4. Method

The study population of this research is composed of participants at Disaster Management Seminar which was held at Gadjah Mada University in Yogyakaruta, Indonesia, from March 15 to 17 in 2007. After obtaining informed consent, the total of 215 people participated in this research and answered the questions (valid response was 200). Based on the conceptual framework, Level and Type of Social Capital by Krishna and Shrader, a self administrated questionnaire was developed to identify Puskesmas' trust, and social capital, especially Bonding Social Capital and Bridging Social Capital among Indonesian communities. The questionnaire consisted of six parts, such as sociodemographic characteristics, awareness and preparation for natural disasters, mutual cooperation and trust, social norm and network, and trust toward Puskesmas. The data were analyzed for statistical significance by chi-square test. Statistical significance was set at $p<0.05$.

5. Results

【Sociodemographic Characteristics】 Of all respondents, "20s" was the dominant age category representing 78 or 39.0%. Average age was 24.6 yeas old, while the youngest was 17 years old and the oldest 52 years old (SD±8.1). Female respondents (163 or 81.5%) were dominant. More than half of the respondents (90 or 55.2%) lived in Yogyakaruta, followed by JawaTengah (40 or 24.5%). For occupation among the respondents, "students" was the largest group (134 or 69.4%), followed by "nurse" (52 or 26.9%). As for academic background, "high school degree" had the highest representation (94 or 49.0%), followed by "university degree" (76 or 39.0%). Those with the household income per month of more than 1,000,000 RP was 113 or 59.0% (See Table 2).

Table.2Sociodemographic Characteristics among Research Participants	**Number** (n=200)	**Percent** %
Age(yr)		
>19	48	24.0
20-29	78	39.0
30-39	16	10.3
40-49	10	6.5
50<	3	1.9
Sex		
Male	37	18.5
Female	163	81.5
Residence		
Yogyakaruta	90	55.2
Jawa Tengah	40	24.5
Occupation		
Nurse	52	26.9
Student	134	69.4
Academic Background		
University degree	76	39.0
High school degree	94	49.0
Annual income >RP1000000	113	59.0

【Awareness of Natural Disaster】 The number of respondents considering that natural disaster will happen in the near future was 155 (79.5%). In addition, the number of respondents who were sometimes afraid of potential natural disaster was 117 (59.7%). The number of respondents having emergency kit was 123 (63.7%). The number of respondents having Information concerning disaster mitigation or prevention from local government was 68 (36.2%). However, 79 (39.4%) responded that they obtained information from other means, and descriptive answer indicated that mass media such as TV, radio, and internet web site were main sources to get information concerning disaster mitigation (See Table2).

【In Case of Natural Disaster】 The number of respondents sharing their food with neighbors was 193 (96.5%) , and that for those helping reconstruct their neighbors' houses was 178 (89.0%) . The number of respondents considering their neighbors will share food with them was 184 (92%) , and that for those considering their neighbors will help them to reconstruct their house was 179 (89.5%) (See Table2).

【Health Seeking Behavior】 Respondents using hospitals at their delivery were dominant and represented 145 (72.5%) and its main reason was due to the quality of health services. In the case of minor illness such as infectious disease, Puskesmas was the main health facility for respondents and was frequented by 78 (38.0%) . The main reason for the popularity was its accessibility (97 or 41%) . In the case of serious disease such as bone fracture or heart and respiratory disorder, respondents tend to use the hospitals (191 or 95.5%) , and the quality of health service was the main reason (179 or 90%) (See Table 3).

Table.3 Disaster respondent and health seeking behavior among research participants	**Number** (n=200)	**Percent** %
Anticipation of Natural Disaster	155	79.5
Fear of natural disaster	117	59.7
Having emergency kit	123	63.7
Orientation provider in natural disaster		
Local government	68	36.2
Other s	79	39.4
In case of Natural Disaster		
I will share food with neighbors	193	96.5
I will help to reconstruct to neighbors	178	89.0
My neighbors will share food with me	184	92.0
My neighbors will help me to reconstruct house	179	89.5
Disaster experience		
Natural Disaster experience of individual	120	60.0
Natural disaster experience of family members/ relatives	143	72.0
Health seeking Behavior		
Hospital	145	72.5
Minor illness		
Pusukesmas	78	38.0

Serious illness

Hospital	191	95.5

【Social Capital】The number of neighbors to greet to and to borrow from or lend to was 64 or 29.0% for the category of "6－10 persons" and 117 or 58.5% for "1－5 persons," respectively. The number of respondents having neighbors who are willing to help them was 124 (64.0%). The number of respondents who sometimes trust neighbors was 100 (50.0%)、and that for those who trust persons other than neighbors was 118 (59.0%). The number of respondents having local community organizations such as women committee, youth committee, sports club and village committee was 124 (62.0%). The number of respondents sometimes participating in self group organizations was 97 (48.5%), and that for people who have local events in their community was 90 (45.0%) The number of respondents who sometimes participate in local events was 107 (54.0%) (See Table 4).

Table.4 Social capital among research participants

	Number (n=200)	Percent %
No. of neighbors to greet to		
1-5	58	29.0
6-10	64	33.0
11-20	42	21.0
>20	15	7.5
No. of neighbors to borrow things		
1-5	117	58.5
6-10	46	23.0
11-20	12	6.0
>20	4	2.0
People helps neighbors in own communiry		
Never	5	2.5
Rarely	13	6.5
Sometimes	52	26.0
Often	124	64.0
Neighbors can be trusted in own community		
Never	4	2.0
Rarely	15	7.5
Sometimes	100	50.0
Often	77	38.5

Person in other district can be trusted		
Never	4	2.0
Rarely	38	19.0
Sometimes	118	59.0
Often	35	17.5
Existence of active social groups	124	62.0
Participation in social groups		
Sometimes	97	48.5
Often	47	23.9
Local event/ volunteer work		
Sometimes	90	45.0
Often	86	43.0
Participation in local event		
Sometimes	107	54.0
Often	44	22.0

【General Questions on Puskesmas】

Respondents who were very satisfied with and satisfied with health services provided by Puskesmas were dominant and represented 91 or 45.5%. The number of respondents who suffered from natural disaster was 120 (60.0%) and that for those whose family members or relatives also suffered from natural disaster was 143 (72.0%). Many (65 or 42.0%) responded that their neighbors will provide emergency support in the case of natural disaster. This was followed by Puskesmas as the primary helpers representing 51 or 24.0% (multiple answers) (See Table.5).

The correlation existed between trust in Puskesmas' operation in natural disasters, and the number of neighbors to greet to (p=.030), and the frequency of participation in local events (p=.032). Also the correlation existed between province and participation in local events (p=.007) and Puskesmas' trust (p=.000).

Table.5Attitude toward Pusukesmas in own community	**Number** (n=200)	**Percent** %
satisfaction of Puskesmas services		
Never	5	2.5
Rarely	99	49.5
Sometimes	81	40.5
Often	10	5.0

Emergency Support Provider		
Neighbor	65	42.0
Puskesmas	51	24.0
Puskesmas can be trusted in natural disasters	158	79.0

6. Discussion

This study showed that a majority of Indonesian respondents are satisfied with medical services provided by Puskesmas, but found that they only use Puskesmas for only minor problems, and seek treatment from non-Puskesmas medical institutions at the time of childbirth or serious ailments. Judging that hospitals provide a higher level of medical services than Puskesmas, many people tend to use locally-accessible Puskesmas only when suffering from minor conditions, for which the quality of medical care does not affect treatment outcome.

Puskesmas is aimed at providing primary medical care services, and does not necessarily offer advanced diagnostic capacity. Not all Puskesmas centers can conduct blood tests, or are equipped with testing instruments for X-rays or electrocardiography. Some do not even have communications systems such as telephone and facsimile. In terms of human resources, some centers do not have resident medical practitioners, or just one to up to three inexperienced doctors who only finished medical schools one or two years earlier, assisted by paramedicals such as nurses, midwives and medical laboratory technologists. The continuing education program for Puskesmas staff currently does not cover emergency medicine.

The scope of emergency medical services Puskesmas can offer must be broadened, so that each center can provide medical care at the time of disasters and other emergencies. In other words, there must be a systematic and continuous approach in expanding Puskesmas' medical equipment and facilities to upgrade its capacity to deal with more emergency conditions, and fostering human resources capable of handling emergency medical care. However, given its limited resources, the most pressing task for now is to develop a medical care system that enhances Puskesmas' diagnostic capacity and that facilitates accurate and swift processing of referrals.

The development of an emergency medical care system requires community-wide initiatives, in addition to the enhancement of Puskesmas' functions. It is important to establish partnership with administrative bodies (other than local medical facilities), fire-fighting authorities and local residents. According to the results of this study, the figures for "trust" and "moral" were high in the social capital among Indonesian people, but the "network" bonding, reflecting participation in community organizations and local events, was relatively low.

Indonesians continue to live in the spirit of "Gotong-Royong". Gotong-Royong, translats as "reciprocal exchange", which signifies the approach of reciprocally helping each other (including extending a helping hand to the weak) to equalize the satisfaction level of the overall society. It forms the core foundation of Indonesian society. In rice farming communities in the agricultural parts of Indonesia, people help each other when planting rice seedlings or harvesting rice crops. Offers of labor may be reciprocated with labor, or assistance during the harvesting season may be paid back in the form of harvested crops or cash. One of the community systems that underpin the communal society is a neighborhood association unit called RT (meaning "neighborhood collaboration"). Each RT, consisting of 30 - 50 households, undertakes local cleanup activities, arranges assistance at weddings / funerals, and even serves as an outpost for local

government offices. It is a system imported from Japan during the war, and the Japanese equivalent term "Tonarigumi" is still used today. The unit was occasionally used for monitoring locals' behavior and political thoughts, just as the "Goningumi" neighborhood units did in Japan during the Edo Period.

This spirit of mutual help is said to be effectively functioning in community redevelopment as part of post-disaster reconstruction operations. For example, villagers, under the leadership of village elders, band together to rebuild damaged local homes one after another. In Indonesia, the community unit similar to Japan's community association, supports local collaboration work, and may be able to serve as a unit for supporting restoration work following disasters. This shows that bonding social capital has already taken root in the country.

In community-led operations for disaster management and crime prevention, bridging social capital plays an important role, as explained earlier. For this reason, it will become increasingly more important to reinforce the ties among close-knit communities, and ties among such communities and local governments / Puskesmas / other non-community entities. This study indicates that the level of trust to Puskesmas is high among people who report to have a large number of people they exchange greetings with, and among those who participate in local government organizations, or among those who live in communities that organize events for local residents. Building people's trust in Puskesmas requires, needless to say, that the centers provide medical services that meet the needs of local residents, and improve the quality of medical care they provide. Yet, these measures should also be combined with efforts to reinforce and expand Puskesmas' networks with non-Puskesmas fire-fighting organizations, local authorities, resident groups as well as individual residents. To this end, it is also important for Puskesmas to internally foster human resources that can play the bridging role.

To boost diagnostic capacity, it is essential to station experienced resident doctors and install medical equipment that facilitates advanced diagnosis. Yet, this is not a very practical option in view of Indonesia's current status. Holding the key is to reinforce the diagnostic capacity of individual healthcare workers, including nurses from local communities, instead of relying on medical equipment. One example of such an approach is the acquisition of physical assessment skills, which involve the use of simple medical tools to take a full-body scan.

7. Conclusion

Social capital in Indonesian community was enhanced in terms of trust and moral which may be derived from the spirit of mutual help deeply-rooted in Indonesian society. The social capital is one of important elements to building the well-managed community in disaster mitigation. Puskesmas have potential to play a central role in enhancing 'Bridging Social Capital' in community in order to build a network among local government, community organization, and individual in the community. To achieve this goal, the health service provided in Puskesmas need to be reconsidered and reconstructed from the viewpoint of quality and quantity in order to provide emergency medicine and care; thereby Puskesmas will be a platform for the community-based disaster health management by obtaining trust and satisfaction of local poeple.

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