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## Original Article

# Place of Death under Home-Based Palliative Care Services for Older Patients in Urban Areas

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## SUMMARY

**Background:** The preferences for place of death at home were reported in many articles. But it is getting more difficult in urban area and the trends of death in the institution was increased. We examined the place of death of elder patients who received the hospice home care in highly urbanized area.

**Materials and Methods:** There were 403 patients enrolled in home care service between 2017/1/1 and 2018/12/31. The eligibility criteria were those who were more than 65 years old and passed away during the study period. The gender, age of registration, disease, place of death, duration of caring, length of stay, primary care sites were examined.

**Result:** There were 116 females and 103 males enrolled. Among of them, 114 of cancer and 32 of non-malignancy patients died in the hospital. The place of death of cancer patients were significant higher in hospital ( $p < 0.05$ ). Whether the primary care site was home or care home, most of patients died in hospital ( $p < 0.001$ ). The similar result was also noted in the duration of caring.

**Discussion:** Place of death is determined by multiple factors and is therefore dependent on individual circumstances. In our study, the ratio of hospital death was higher than other articles. This may indicate the higher chance of hospital deaths for the older people who received hospice home care service in urban area. Our study indicated that cancer patients trended toward hospital death ( $p < 0.05$ ). The experience of hospice admission may also result in more hospital deaths in our study.

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## 1. Introduction

Although everybody dies, only a small proportion of people die suddenly. In Taiwan, the five leading causes of death in 2018 were cancer, cardiovascular disease, pneumonia, cerebrovascular disease and diabetes mellitus.<sup>1</sup> Most of these diseases, in the terminal stage, deaths are expected, and the preferred place of death had been recommended as a quality indicator of palliative care. Home base palliative care service, also named as hospice home care service in Taiwan, is an crucial model of palliative care. Home provided a comfortable, familiar setting for patients and families. Patients can stay with their loved ones and spend their last days with a sense of dignity. Besides, this model is more cost-effective than long-term hospital stays. Since the proportion of elderly people in Taiwan rises, and the number of hospice beds are limited, many terminal patients may stay at home or long-term-care unit (hereafter “care home”) during their final stage of lives. Hospice home care service can provide the best quality of live for terminal patients who cannot or will not stay in hospital.

In Taiwan, The Catholic Sanipax Socio-Medical Service and Education Foundation provided the services for terminal cancer patient at home since 1983 but didn't develop it systematically.<sup>2</sup> The first

hospice in-patient unit was established in Mackay Memorial Hospital in 1990, and then the palliative care movement was promoted nationwide. After that, The National Health Insurance (NHI) started to provide the coverage for palliative home care program since 1996. The NHI has expanded the indications of hospice care from patients with advanced cancer to those with other advanced non-malignancy disease since 2009. The numbers of facilities which provide the service for hospice home care were raised from 70 to 154 between 2011 and 2019.<sup>3</sup>

The preferences for place of death of terminal patients is a key issue in end-of-life care and be involved in many advanced care planning (ACP) programs. Many articles also illustrated that patients preferred to die at home.<sup>4–6</sup> An article published by Tang<sup>7</sup> in 2003, demonstrated that nearly 90% of the terminal cancer patients preferred to die at home in Taiwan. Gomes et al.<sup>8</sup> reviewed 210 studies in 2013 and revealed that home preference estimated ranged from 31% to 87% for patients, 25% to 64% for caregivers and 49% to 70% for the public. Hospice home care service will play an significant role to provide the optimal palliative care that supports patients and caregivers who wish to stay at home.

There were 67,733 deaths in urban area in Taiwan (six municipalities) in 2018, and 62.5% of them were died in the hospitals. This ratio raised to 66.86% in highly urbanized area such as Taipei and New Taipei City. These are higher than the rural area (32,154 deaths, 50.62%).

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In Taiwanese culture, many patients or families prefer to keep a “last breath” to back home before death. But it is getting more difficult in urban area and the trends of deaths in the institution were increased. Our study examines the place of death of elder patients in a medical center which provides the hospice home care program in highly urbanized area.

## 2. Materials and methods

The purpose of our article was to study the factors that influence the place of death of older patients who received hospice home care in the urban area. There were 403 patients enrolled in hospice home care service between Jan. 1<sup>st</sup>, 2017 and Dec. 31, 2018. The eligibility criteria of patients for inclusion into the study were those who were more than 65 years old when registration and pass away in the study period. The gender, age of registration, disease (malignancy or non-malignancy), place of death, duration of caring, length of stay (LOS, if patients died in the hospital), primary care sites (home or care home) were recorded. Considering the proportion of care home deaths were small ( $n = 16$ , 7%), the place of death was divided into two groups; hospitals and primary care sites. Exclusion criteria were those who lost of follow up, transferred to other hospital, ending of the service and refused home visit.

In Taiwan, although the hospice home care provided the service of around-the-clock counseling phone care, some patients would visit emergency room (ER) when they need help. We also reviewed the patients who died in the hospital and visited ER before their last admission. Although all of them died at hospital, the factors influencing the transfer to ER were examined.

To examine the different factors influencing the place of death, the  $\chi^2$ -test was used for independent variables. The study protocol was reviewed and approved by the Institutional Review Board of the Mackay Memorial Hospital (20MMHIS026e).

## 3. Result

There were 116 females and 103 males enrolled. The mean age of them were 81.9 years old and ranged from 65 to 105. One hundred and sixty-six of them were advanced or terminal cancer patients and 53 were non-malignancy diseases which met the NHI hospice home care service criteria. Among of them, 114 of cancer and 32 of non-malignancy patients died in the hospital. There were 86 very old patients (more than 85 years old) and 52 of them died in the hospital. Basic characteristics of these patients are list in Table 1.

### 3.1. The gender

There was no difference between the place of death and gender (Chi-square value = 1.941;  $p = 0.379$ ) (Table 2). We also examined the variables of primary care sites, duration of caring, LOS and diagnosis. There were no relations between these factors with gender.

### 3.2. The diagnosis

Among the 166 cancer patients, most of their primary care sites were at home (88%. Chi-square value = 26.074;  $p < 0.001$ ), but no difference for non-malignancy patients (54.3% at home). The place of death of cancer patients were significant higher in hospital (Chi-square value = 13.978;  $p < 0.05$ ) (Table 2), but there was no difference for non-malignancy patients.

It is reasonable that the duration of caring for non-malignancy patients was significantly longer. There were 60.9% of them using

hospice home care service more than 90 days (Chi-square value = 17.463,  $p < 0.001$ ), and higher duration of caring (Table 2).

### 3.3. Age

With an aging population in Taiwan, the proportion of “very old” elders increased. There were 83 patients who were more than 85 years old in our study. We compared them with those whose age was ranged from 65 to 84. Among the “young old” group, most of them were cancer patients (Chi-square value = 14.077,  $p < 0.001$ ) and cared at home (Chi-square value = 27.557,  $p < 0.001$ ) (Table 3). There was significant difference between the age and place of death (Chi-square value = 9.393,  $p < 0.05$ ) (Table 2).

### 3.4. Primary care site, duration of caring

Whether the primary care site was home or care home, most of

**Table 1**  
Basic characteristics of the older patients receiving hospice home care (N = 219).

Factors	N (%)
Sex	
Male	103 (47)
Female	116 (53)
Age	
65–84	133 (60.7)
≥ 85	86 (39.3)
Diagnosis	
Malignancy	166 (75.8)
Non-malignancy	53 (24.2)
Place of death	
Hospital	146 (66.7)
Primary care site	73 (33.3)
Duration of caring (days)	
1–30	81 (37.0)
31–90	62 (28.3)
≥ 91	76 (34.7)
Primary care sites	
Home	174 (79.5)
Care home	45 (20.5)

**Table 2**  
The factors which related to the place of death.

Factors	Hospital	Home/care home	p
Gender			0.379
Male	69	34	
Female	77	39	
Diagnosis			
Malignancy	114	52	< 0.005
Non-malignancy	32	21	0.364
Age			< 0.005
65–84	94	39	
≥ 85	52	34	
Primary care site			< 0.001
Home	117	57	
Care home	30	15	
Duration of caring			< 0.005
1–30 days	50	31	
31–90 days	45	17	
≥ 91 days	51	25	

**Table 3**  
The relationship between the age and primary care site.

Age	Home	Care home	p
65–84	121	12	< 0.001
≥ 85	53	33	0.698

patients died in hospital (Chi-square value = 67.258,  $p < 0.001$ ). The similar result was also noted in the duration of caring. Because the limitation of NHI payment, the home care staff visited the patient once a week, the duration of caring is related to the times of visit. We examined the patients those whose duration of caring were 1–30 days, 31–90 days and more than 91 days. All of the three groups, hospital is the most place of death (Chi-square value = 12.692,  $p < 0.05$ ) (Table 2).

### 3.5. Using the emergency services

There were 76 patients using emergency services. The three leading causes of transferred to ER were dyspnea (56.6%), fever (28.9%) and disturbance of conscious (19.7%). Because of the critical condition, the LOS of them were significant less than 14 days (Chi square value = 37.621;  $p < 0.001$ ). The other variables (diagnosis, duration of caring) were no significant difference related to using emergency services (Table 4).

## 4. Discussion

Place of death is determined by multiple factors and is therefore dependent on individual circumstances. Gomes et al.<sup>9</sup> indicated six strong factors associated with home death: patients' low functional status, their preferences, home care and its intensity, living with relatives, and extended family support. Other factors, cancer diagnosis, early referral to palliative care, and the caregiver's coping skills were reported by Costa et al.<sup>10</sup> The data in Taiwan, reported by Ko et al.<sup>11</sup> in 2017, the factors influencing home death were physician home visit or not and times of hospitalization.

Although some articles illustrated that terminal patients preferred to spend their end of life at home, the fact that most people die in hospital happened. The trend of hospital deaths was illustrated in Japan, Italy and Korea. But in some countries, such as US, Australia and Canada, more people are now dying at home.<sup>12–14</sup> A letter posted by Shmerling RH<sup>15</sup> in 2018 showed the trend of place of death in the US. Although hospital admission increased (11%) and many people still died in the hospital, the ratio of hospital death decreased (8%). It also showed a dramatic reduction among people with kidney disease and cancer. This trend was related to improvement of availability and acceptability of alternative sites of care, growing of communication and awareness by patients and their doctors. Since the palliative care in Taiwan is well developed, the availability of palliative care and the awareness of medical futility are well established. If we preferred the trend of home deaths, more efforts should be focused on communication with patients and families for preferred place of death. Since "Death" is a forbidding word in our culture, how to training the skill of communication and truth telling should be considered.

Rainsford et al.<sup>16</sup> reported the preferences of home death which were greater in rural than urban areas and had a greater chance of home death than in cities. The reported hospital deaths for older people were ranged from 50 to 57.82%.<sup>13,17,18</sup> In Taiwan, the hospital death for patients received hospice home care service was 56.4%, and 54.2% for elderly people (more than 65 years old).<sup>11</sup> In our study, the ratio of hospital death was 66.7%, which is higher than the above results. This may indicate that the higher chance of hospital deaths for the older people who received hospice home care service in urban area.

There were 166 (75.8%) cancer patients were enrolled in our study. Costa et al.<sup>10</sup> revealed that a cancer diagnosis and the involvement of home care services increased the likelihood of dying in

**Table 4**  
Using the emergency services.

Factors	With ER services	Without ER services	p
LOS			< 0.001
≤ 14 days	51	25	
> 14 days	50	93	
Diagnosis			0.574
Malignancy	54	112	
Non-malignancy	17	29	
Duration of caring			0.237
1–30 days	23	58	
31–90 days	26	36	
≥ 91 days	27	49	

an inpatient palliative care unit. In our study, cancer patients trended toward hospital death ( $p < 0.05$ ). The high proportion of malignancy diagnosis may result in high ratio of hospital deaths.

Another possible reason for the high ratio of hospital deaths in our study may be the characteristic of our hospital. Arnold et al.<sup>19</sup> indicated that the experience of hospice admission would influence the one's preferred place of death. Eighty percent of patients who had never been admitted to the hospice ward wanted to die at home. In contrast, 79% of those with at least one hospice inpatient admission wanted to die in the hospice ward. Our hospital, a medical center in urban area, with a substantial hospice ward which can provide more hospice beds than others. The patients under our hospice home care service could have more chance to admit to palliative ward when necessary. The experience of hospice admission may result in more hospital deaths in our study.

Based on our results, from any point of view, hospitals still the most place of death, especially for the cancer and older patients. Since the high incidence of hospital deaths for older patients in urban area, we suggest that not only the home care staff, training the hospital staff and well-established caring system for terminal patients in the hospitals are very important.

Some limitations of our study deserve mention. First, the preferred place of death was not recorded. Since the Patient Right to Autonomy Act in Taiwan was come into effect in 2019, all of the enrolled patients didn't have ACP nor nominate a preferred place of death. Assessment of preferred place of death of patients receiving hospice home care should be ongoing to support patients' wishes at the end of life. Second, the numbers of non-malignancy patients were limited. Houttekier et al.<sup>20</sup> indicated that a majority of older patients with dementia were died in care home. Similar conclusion was reported by Wilson et al.<sup>21</sup> for serious mental illness patients. In our study, only 20 dementia patients were enrolled (9.1%). Eight of them died in the hospital (40%), five at home (25%) and 7 in care home (35%).

It is worth noting that only 16 care home deaths in our study, and most of them were dementia patients (43.8%). Further study which enrolled more non-malignancy patients should be considered.

### Conflicts of interest

No potential financial and non-financial conflicts of interest to disclose.

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