

ORIGINAL ARTICLES

Cause-specific mortality in A6 death registration system: results from a population-based study in Hanoi 2017, Vietnam

Pham Ngan Giang¹, Nguyen Thi Kim Ngan², Vu Tri Duc^{3*}, Nguyen Phuong Hoa¹, Nguyen Thi Trang Nhung^{2,3}, Nguyen Thi Thu⁴

ABSTRACT

Objectives: Mortality data is vital information on the health status of a population, especially data from developing countries such as Vietnam. This paper describes the mortality status by specific cause in Hanoi city in 2017 from A6 document.

Methods: A cross-sectional study recorded death records of Hanoi residents who died between 1 January 2017 to 31 December 2017 from the death registration system (the A6 document) in 22 over 30 districts in Hanoi. Causes of death were classified based on the International Classification of Diseases, tenth revision (ICD-10). Descriptive statistics were used to show the mortality status of Hanoi citizens in 2017.

Results: There were 20,256 death records in 2017 in Hanoi obtained in this study. The predominant cause of death was non-communicable diseases, particularly cardiovascular diseases, malignant neoplasms, and respiratory diseases. The mortality rate of males was higher than that of females.

Conclusions: This study reported the death incidents by cause in Hanoi, Vietnam with a high percentage of missing. This raised the utter need for updating the death registration system.

Keywords: Mortality rate, non-communicable diseases, Hanoi.

INTRODUCTION

Mortality registration is vital health information for each nation. The application of this information is vast, namely measuring the population development, planning, and initiating interventions, and assessing the implemented policies (1). From a public health perspective, the fundamental role of mortality data is to estimate the burden of diseases (2, 3). The Global Burden of Disease study used vital registration, including death information, to estimate the health impact

of various diseases (4). According to this calculation, the leading causes of death worldwide were cardiovascular diseases (18,562,509 deaths), neoplasms (10,079,637 deaths), and chronic respiratory illnesses (3,974,314 deaths) in 2019 (5). In Vietnam, while a similar pattern was observed in the first two diseases, diabetes, and kidney diseases were the third primary cause of death (50,967 deaths) in 2019 (5). By acknowledging this situation, the Vietnamese Prime Minister issued Decision No.155/QĐ-TTg on approving the “National Strategy for the



Corresponding author: Vu Tri Duc

Email: ductrivu022@gmail.com

¹Hanoi Medical University

²Hanoi University of Public Health

³Vietnam National Children's Hospital

⁴Hanoi population & Family planning Branch

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Prevention and Control of Noncommunicable Diseases and Psychological Disorders, period 2022-2025". Moreover, the mortality data has shown crucial usage in tracking the COVID-19 pandemic (6). They indicated that South Asia had the highest number of excess deaths attributed to COVID-19 during 2020-2021 (6). Therefore, a well-managed death registration system is needed to for every country.

In Vietnam, the death-related information is recorded in the A6 document. The A6 document (or A6/TYT) is a registration form required by the Vietnamese Ministry of Health, according to Circular No. 37/2019/TT-BYT (7). This is the sole data source in Vietnam that can provide data regarding age, gender and specific cause of death. The A6 document was managed by the commune health centers (CHC), the primary level in the health management system. Then, the report of mortality cases is routinely sent to district, provincial and national authorities before 31 March each year to synthesize an annual report.

The A6 document shown great reliability in studies of both Northern and Southern areas of Vietnam. For example, studies in Quang Ninh and Thai Nguyen found that A6 document covered approximately 89.3% of the total deaths in 2014 (8). Another research estimated a 93.7% completeness of death registration in Bac Ninh in 2008 (9). The corresponding results for Lam Dong and Ben Tre in the south were 94.6% and 92.2% (9). Meanwhile, Hanoi is one of the largest cities in Vietnam with about 5 deaths per 1000 population. However, this annual deaths, reported by the General Statistics Office (10), did not provided the specific cause of death. Therefore, we aims at describing the cause-specific mortality of Hanoi citizens recorded in the A6 document. The results of our studies may provide a comprehensive glance at the

mortality distribution and the death recording status in A6 document in Hanoi.

METHODS

Research design: A cross-sectional study was used.

Study site and time: Hanoi incorporates 30 districts with the total population approximated 7.420,1 million people in 2017 (11). Gender ratio is 98 males per 100 females. Migration rates in 2017 in Hanoi were 3.0‰ for in-migration rate and 3.3‰ for out-migration (11). In this analysis, we obtained death records from the A6 death registration in 22 over 30 districts in Hanoi in 2017, including: Ba Dinh, Hoan Kiem, Tay Ho, Long Bien, Cau Giay, Dong Da, Hai Ba Trung, Hoang Mai, Dong Anh, Bac Tu Liem, Me Linh, Ba Vi, Dan Phuong, Hoai Duc, Quoc Oai, Thach That, Chuong My, Thanh Oai, Thuong Tin, Phu Xuyen, Ung Hoa, and My Duc. These districts contributed 75% of total population in Hanoi in 2017. The data in other 8 districts were not available at the time this study had been conducted.

A6 death registration system: Figure 1 presents how death information in A6 system is collected and reported in communities. In sum, information of individual death in each commune is recorded in the A6 document. This data is collected from population collaborators, also known as village health workers, and leaders of the unions such as Famer Union, Veteran Unions. While information such as age, gender and address and cause of death are mainly provided by village health workers living in the area, place of dead (at home or in health facility). Village health workers reports deaths to CHC's staff. These deaths are recorded in A6 for each month. Then, every six months, CHC's staff summarize death information from A6 to report to district level and higher level. CHC and justice department

in commune often exchange dead lists. Therefore, in some communes, deaths listed

in A6 documents might be the same as this in Justice's document in term of quantity.

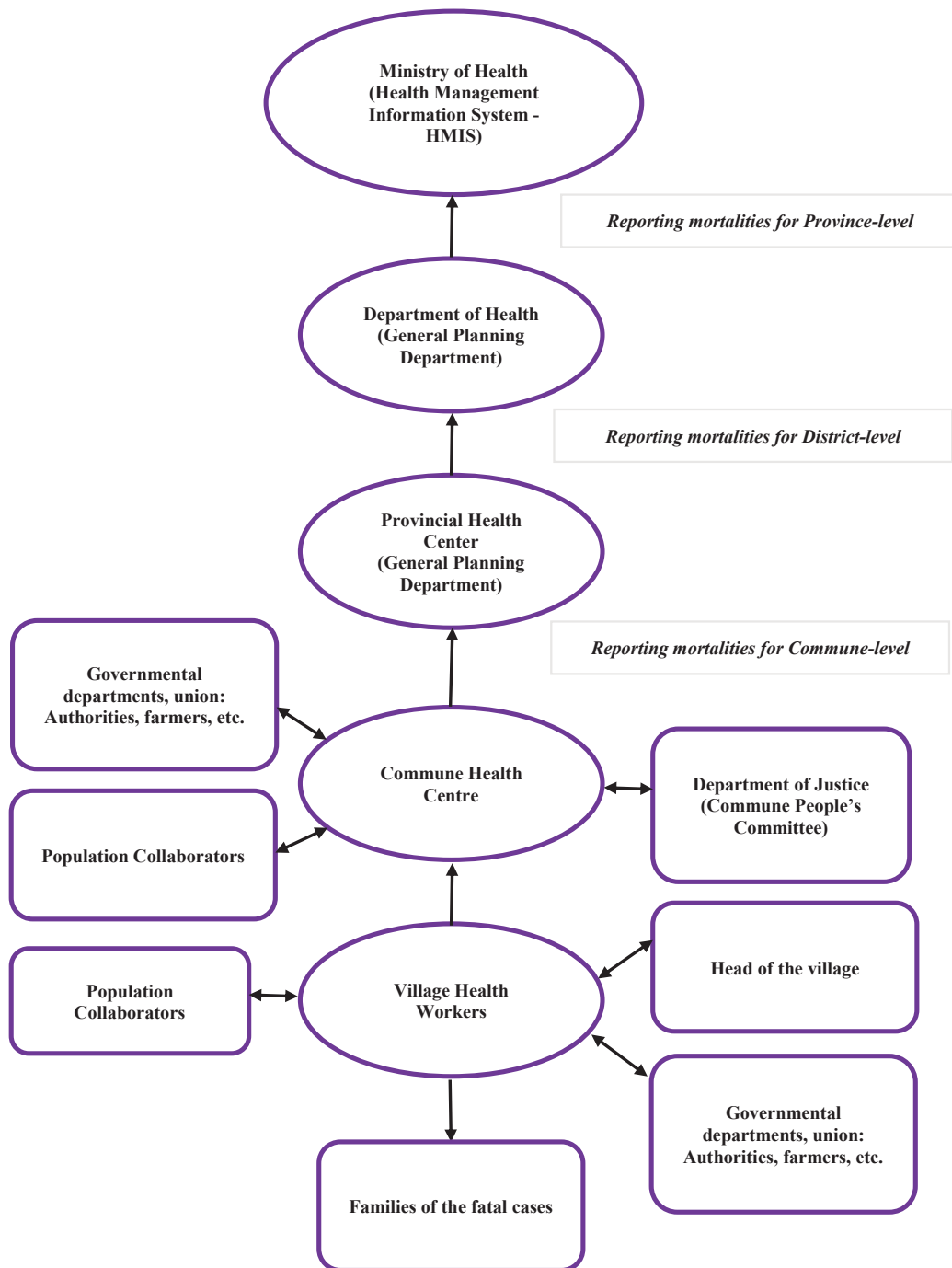


Figure 1. Procedure of Death information collect and report in A6 document registration system

Mortality data: The mortality data was extracted from A6 death registration from. This is the data of each death occurred from 1 January 2017 to 31 December 2017. The extracted variables included age, date of birth, date of death, cause of death, and permanent address. All causes were assigned an International Classification Diseases 10 Revision (ICD-10) following by the World Health Organization (WHO) guidelines by the research team (12).

Population data: We also obtained population data by age and gender in 2017 in 22 corresponding districts from Hanoi Population and Family planning division.

Data analysis: The data was cleaned via Microsoft Excel software (13). A frequency table was applied to the number of populations, number of deaths and the death rate per 1000 population. Three categories of specific causes of deaths were chosen to show, including: 1) Communicable, maternal, perinatal and nutritional conditions; 2) Non-communicable diseases; 3) Injuries, according to the World Health Organization guidelines on mortality coding. The detail of ICD-10 coding (International Classification of Diseases version 10th) was described elsewhere (14). The mortality rate for each district was shown in the map by using QGIS 3.22.6 software (15).

Ethical approval: This study was reviewed

and approved by the Ethics Committee of the Hanoi University of Public Health (Ref. No. 020-265/DD-YTCC). Written informed consent for participation was not required for this study by the National Legislation and the Institutional Requirements.

RESULTS

There were 20,256 deaths were recruited in this study (Table 1). In Hanoi, mortalities of people (55 year olds and above) exceeded 1000 cases in 2017 (Table 1). The highest number of deaths were 85 and above age group with approximately 5,613 deaths (equivalent to 83.45 cases per 1000 people). For children under 15 years old, infant deaths (under 1 year old) were highest with about 109 deaths (0.73 deaths per 1000 infants). Between genders, the number of male deaths were higher than that of female, except people 80 years old and above. However, the mortality rate of males were still higher than female for 80-85 age group (55.53 and 37.13 deaths per 1000 population) and 85 and above age group (104.06 and 79.93 deaths per 1000 population). Moreover, the mortality rate of infant females (0.75 per 1000 female infants) were higher than that of males (0.72 per 1000 male infants).

Table 1. Mortality rate in the total, and by age groups and gender, Hanoi, 2017

Age groups	Male			Female			Total		
	Population	Death	Death rate (per 1000 population)	Population	Death	Death rate (per 1000 population)	Population	Death	Death rate (per 1000 population)
<1	80,156	58	0.72	68,399	51	0.75	148,555	109	0.73
1-4	209,675	62	0.30	174,725	27	0.15	384,400	89	0.23
5-9	265,760	50	0.19	230,976	20	0.09	496,736	70	0.14
10-14	217,029	43	0.20	198,346	26	0.13	415,375	69	0.17
15-19	163,946	54	0.33	161,248	31	0.19	325,194	85	0.26
20-24	195,161	111	0.57	220,866	30	0.14	416,027	141	0.34
25-29	244,064	119	0.49	287,623	48	0.17	531,687	167	0.31
30-34	261,501	182	0.70	282,163	60	0.21	543,664	242	0.45
35-39	232,138	281	1.21	233,381	77	0.33	465,519	358	0.77
40-44	196,457	436	2.22	195,425	118	0.60	391,882	554	1.41
45-49	164,108	530	3.23	165,401	141	0.85	329,509	671	2.04
50-54	143,564	776	5.41	151,270	207	1.37	294,834	983	3.33
55-59	158,798	1,091	6.87	172,598	349	2.02	331,396	1,440	4.35
60-64	119,569	1,146	9.58	128,641	410	3.19	248,210	1,556	6.27
65-69	74,276	970	13.06	94,070	500	5.32	168,346	1,470	8.73
70-74	50,017	1,041	20.81	59,830	643	10.75	109,847	1,684	15.33
75-79	39,743	1,292	32.51	50,908	940	18.46	90,651	2,232	24.62
80-85	26,289	1,327	50.48	38,830	1,396	35.95	65,119	2,723	41.82
85+	21420	2,038	95.14	45,843	3,575	77.98	67,263	5,613	83.45

Table 2. Number of death cases by causes and age groups in Hanoi inhabitant age above 4, 2017*

Diseases	Age group																
	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Communicable, maternal, perinatal and nutritional conditions	3	4	0	1	3	6	10	17	20	28	35	44	64	59	88	109	232
Infectious and parasitic diseases	1	2	0	0	2	5	3	8	13	12	18	11	19	16	14	17	22
Respiratory infections	2	2	0	1	1	1	7	9	7	16	17	33	45	43	74	92	210
Non-communicable diseases	24	21	27	45	57	105	176	289	423	649	1,017	1,103	937	980	1,186	1,184	1,901
Respiratory diseases	3	2	4	5	6	8	11	10	24	27	65	76	73	106	187	232	489
Cardiovascular diseases	1	1	7	11	14	26	42	82	91	182	254	318	329	385	553	598	1,047
Congenital anomalies	8	2	3	2	1	1	1	0	0	0	1	0	0	0	0	0	0
Diabetes mellitus	0	0	0	1	0	2	2	5	5	8	17	18	22	38	35	34	34
Digestive diseases	0	1	0	1	3	5	22	22	39	38	64	48	40	32	37	31	36
Endocrine disorder	0	0	0	0	1	0	0	0	1	0	0	1	7	4	4	1	1
Genitourinary diseases	3	0	1	3	1	4	11	8	14	17	22	27	26	29	30	23	43
Malignant neoplasms	7	14	12	21	29	55	84	158	242	375	582	606	433	374	331	257	244
Musculoskeletal diseases	0	1	0	0	0	0	0	1	2	1	6	5	2	7	7	2	4
Other neoplasms	2	0	0	1	2	3	2	3	4	1	5	4	2	5	2	6	3
Skin diseases	0	0	0	0	0	1	1	0	1	0	1	0	3	0	0	0	0
Injuries	15	25	41	64	65	70	69	74	53	69	60	40	28	13	20	11	15
Intentional injuries	0	0	3	3	6	9	15	16	9	11	8	2	4	1	3	0	0
Unintentional injuries	15	25	38	61	59	61	54	58	44	58	52	38	24	12	17	11	15

*Data was collected in 22 districts over 30 districts in Hanoi, in 2017

The mortality rates (per 1,000 population) due to malignant neoplasm of male were highest in Ung Hoa and My Duc (above 1.5 deaths per 1,000 population) (Figure 3). On the other hand, the highest death

rates of female were highest in Dan Phuong and Quoc Oai (above 0.7 deaths per 1,000 population).

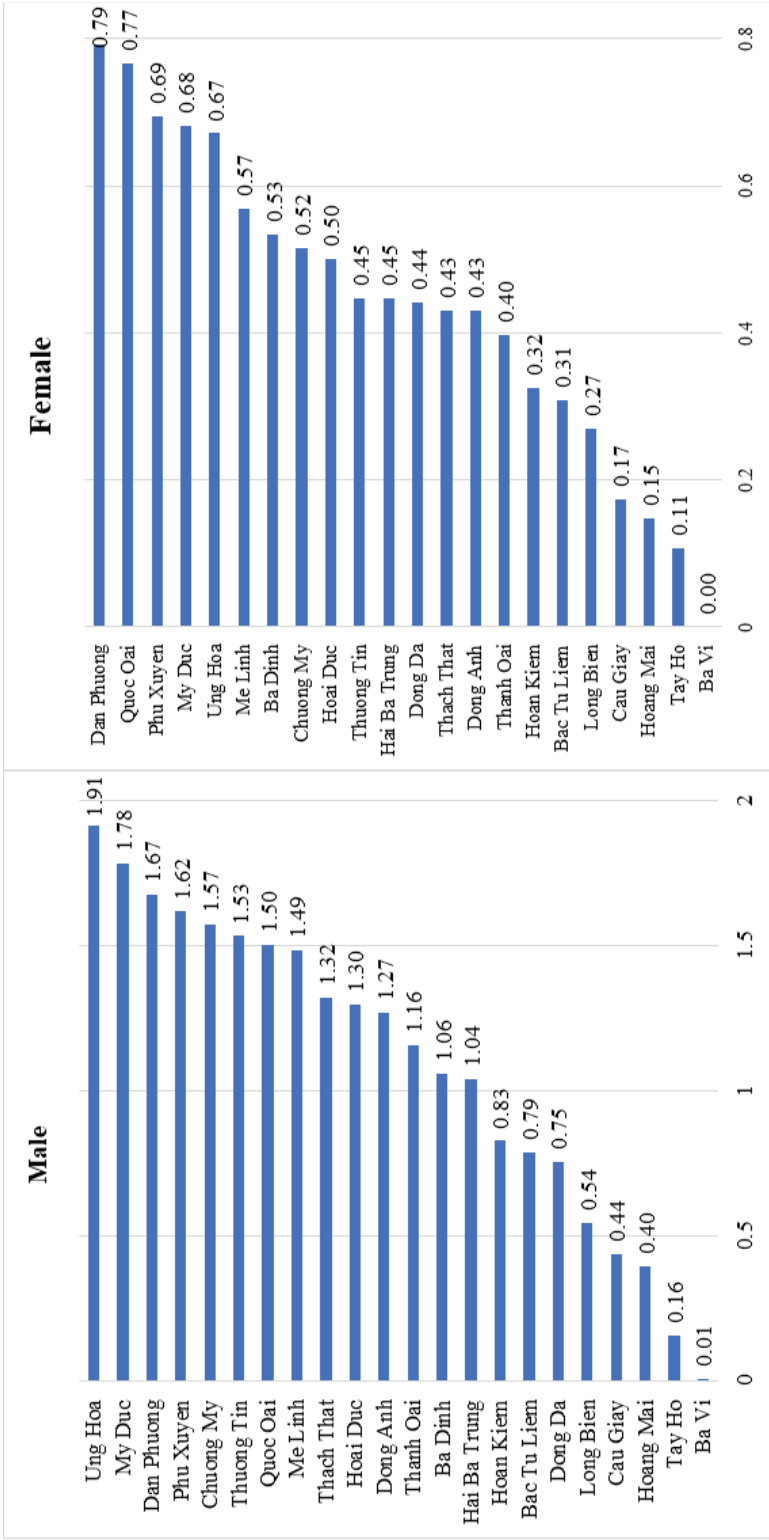


Figure 3. Mortality rates (per 1,000 population) due to malignant neoplasm by gender and districts in Hanoi, 2017

DISCUSSION

Our study aimed at describing mortality rates in Hanoi using data from A6 documents. There are three official death record systems in Hanoi including: A6 death registers systems, Population unit of department of Statistic and Department of Justice. There are differences between these results since each of them has significant ways to register fatal cases. Mortalities in A6 document is gathered by commune healthcare center officers and then submitted to Hanoi Centers for Disease Control and Prevention (CDC). Population department and Department of Justice collected mortalities data based on Hanoi People's Committee, which had received reports from population unit of Statistic department. However, we decided to use data in A6 document because not only did A6 document collect specific causes of deaths, but the data were recorded by trained healthcare staffs. Additionally, A6 was proven a highly reliable sources of registering death information (8, 9).

Our study found that most deaths occurred from 55 years old. This may indicate that older people have lower quality of life compared to the youth. Various factor can affect the quality of life of older people in Vietnam including age, living in solitary, and persistent illness (16, 17). The findings from previous studies also shown that female had lower quality of life compared to that of male (16, 17). However, our findings show that the mortality rates of male were higher than female, especially in older age. This discrepancy might be due to the geographical differences in research. While prior studies focused on rural areas, we included urban regions in our study. Thus, we need more assessments on heterogeneity of socio-economic factors between the urban and rural areas.

The findings show disproportionately high numbers of death due to non-communicable

diseases, particularly cardiovascular diseases, malignant neoplasms, and respiratory diseases. In recent decades, non-communicable diseases has becoming an alarming burden of Vietnamese health due to accelerated urbanization and economic growth (18). The drawback of rapid development consisted of environmental degradation (19) and un-healthy lifestyle (20). One of the most detrimental effects of non-communicable diseases is the inequality of health expenditures spent on treating these diseases (21). People with poor socio-economic status are at higher risk of suffering from catastrophic health expenditure (unable to pay for medical treatment) than others (21). Therefore, Hanoi needs prompt interventions to manage the non-communicable disease situation and strengthen the resilience of citizens, especially people living in poverty.

There were several limitations in this study. Firstly, although this study could not cover the entire Hanoi's provinces, however we were able to attain 22/30 provinces. These provinces covers a majority proportion of the population in Hanoi (22). Secondly, there were still missing information in A6 document. Nearly half of the observation could not attach the ICD-10 code due to ambiguous records reason of death (data not shown). This contradicts with previous research conducted in Northern provinces, apart from Hanoi, which shown completeness in death registration system (8, 9). Therefore, future study needs to focus on the quality of mortality recording in Hanoi.

CONCLUSION

Non-communicable diseases contribute significantly to the burden of mortality among Hanoi citizens in 2017. The number of deaths among elderly people are higher than that of the youth. The death rate (per 1000

population) of male were higher than that of female. Further research on the completeness analysis of death record is needed in Hanoi.

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