
RESEARCH COMMUNICATION

Development of Population-based Cancer Mortality Registration in the North of Viet Nam

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Abstract

Background: Regional cancer distributions provide useful pointers to potential environmental risk factors. Cancer death registration data are also basic for checking completeness of population-based registration of cancer incidence. The aim of the present project was to develop population-based cancer mortality registration in various regions in the North of Viet Nam. **Methods:** Cancer data were accessed from the database of population-routine-based death registration performed by medical workers at commune health stations based on the guidelines of the Ministry of Health. All deaths occurring in the communities were registered and the registration process was monthly reviewed for each fatal case regarding the name, age, sex, address, occupation, date - place - cause of death, and information concerning to pre-death medical care during the study period from 1999 to 2005. The list of deaths and residents of the study population were carefully cross-checked with other information sources to avoid under or over registration. The study sites were Red River Delta areas and a high-mountain area. The world population structure was used to estimate age-standardized cancer mortality rates per 100,000 (ASR). **Results:** During 4,330,620 person-years estimated during 1999 to 2005, 21,108 deaths were registered. The crude death rate from all causes was 487.4 / 100,000. Among them, 4,244 cancers in all sites (2,835 in males and 1,409 in females) were registered, giving mortality rates / 100,000 of 134.6 and 63.3 (crude), and 155.7 and 54.3 (ASR), for males and females, respectively. The rate for the high-mountain area was only half (45.5) those in the Red River Delta (95.2-117.4). Male to female ratios were ranked from 2.2 to 3.1. Cancer accounted for about 20% of all causes of death. **Conclusions:** The present findings suggest that in Viet Nam, development of reliable population-based cancer mortality registration is feasible and practical.

Key Words: Cancer mortality - population-based-routine-death registration - developing countries - Viet Nam

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Introduction

Databases from population-based cancer mortality registration provide infrastructure for various approaches in conducting cancer research. For example, stomach cancer mortality from a Miyako cohort study in Fukuoka, Japan, allowed determination of dietary risk factors for this cancer type (Ngoan et al., 2002a). In addition, regional cancer distribution provides useful data to explore potential environmental risk factors underlying cancers. Cancer death registration data are also basic for checking completeness of population-based registration of cancer incidence. However, very little population-based cancer mortality registration has hitherto been performed in Viet Nam. Therefore, the present project was conducted to develop population-based cancer mortality registration in various regions in the North of Viet Nam.

Materials and Methods

The present study was conducted in three regions in the North of Viet Nam: high mountain Bac Kan province-Cho Don district, Phu Tho midland province with various industrial zones-Lam Thao district and the whole Nam Dinh province of the Red River Delta with an agriculture background. Information on death from all causes included cancer was collected for the period 1999 (National census) to 2005 for Bac Kan and Phu Tho provinces and 2004-2005 for Nam Dinh province.

Data for cancer cases (Nominator) and population (Denominator) were actively searched for and collected from three sources: First, Departments for provincial statistics to collect data on population; second, the Department of Population & Family & Children to collect number of deaths during the study period and also data for population; and

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Table 1. Number of Deaths and Crude Mortality Rates per 100,000

Province	Region	Time Period	Person-years	Number		Crude rate/100,000	
				All Causes	Cancers	All Causes	Cancers
Phu Tho	Rural+Industry	1999-2005	805,095	3,563	817	442.6	101.5
Nam Dinh	Rural	2004-2005	3,414,164	17,125	3,377	501.6	98.9
Bac Kan	Mountain-high	1999-2004	111,361	420	50	377.2	44.9
Total		1999-2005	4,330,620	21,108	4,244	487.4	98.0

third Commune Health Stations to collect list of deaths and their causes.

Based on the first and second sources, population and number of deaths during the study period for each commune of these three provinces were determined. A rough check for completeness of death registration was examined by comparing crude death rate per 100,000 person-years with the estimated data annually published by the Ministry of Health for these three regions.

For each commune, the cause of death for each case was

accessed from the A6-YTCS death registration and determined again by the head of commune health station for a check of accuracy of identified cause of each fatal cancer. This process has been described previously (Ngoan, 2006). All deaths occurring in the communities were registered at the commune health stations. This registration process was monthly reviewed for each fatal case regarding the name, age, sex, address, occupation, date - place - cause of death, and information concerning pre - death medical care. A network linking the Hanoi Medical University-each

Table 2. Age-specific Cancer Mortality Rates per 100,000 by Province

Age	Male	Female	Both	Person-years			Rate/100,000		
				Male	Female	Both	Male	Female	Both
Phu Tho, 1999-2005									
0-9	2	0	2	78,421	74,712	153,133	2.6	0.0	1.3
10-19	3	5	8	94,790	92,309	187,100	3.2	5.4	4.3
20-29	9	8	17	66,347	66,315	132,662	13.6	12.1	12.8
30-39	32	12	44	60,797	63,154	123,952	52.6	19.0	35.5
40-49	68	29	97	39,929	44,088	84,017	170.3	65.8	115.5
50-59	110	55	165	20,026	23,520	43,546	549.3	233.8	378.9
60-69	145	48	193	18,799	23,435	42,234	771.3	204.8	457.0
70-79	150	56	206	9,899	17,251	27,150	1515.3	324.6	758.7
80+	41	42	83	2,684	8,619	11,303	1527.8	487.3	734.3
Unknown*	1	1	2						
Total	561	256	817	391,692	413,403	805,095	143.2	61.9	101.5
Nam Dinh, 2004-2005									
0-9	15	16	31	273,128	263,694	536,823	5.5	6.1	5.8
10-19	25	19	44	396,919	372,647	769,566	6.3	5.1	5.7
20-29	63	37	100	266,584	246,780	513,364	23.6	15.0	19.5
30-39	123	56	179	213,281	243,958	457,239	57.7	23.0	39.1
40-49	337	127	464	234,761	264,304	499,065	143.6	48.1	93.0
50-59	446	203	649	137,079	151,103	288,182	325.4	134.3	225.2
60-69	447	162	609	75,446	93,257	168,703	592.5	173.7	361.0
70-79	550	268	818	40,701	75,667	116,368	1351.3	354.2	702.9
80+	227	244	471	21,494	43,360	64,854	1056.1	562.7	726.2
Unknown	9	3	12						
Total	2,242	1,135	3,377	1,659,393	1,754,771	3,414,164	135.1	64.7	98.9
Bac Kan, 1999-2004									
0-9	2	0	2	9,690	8,665	18,355	20.6	0.0	10.9
10-19	1	0	1	11,397	11,900	23,297	8.8	0.0	4.3
20-29	1	3	4	9,701	9,791	19,492	10.3	30.6	20.5
30-39	2	2	4	8,541	8,355	16,896	23.4	23.9	23.7
40-49	3	3	6	5,758	6,318	12,076	52.1	47.5	49.7
50-59	11	2	13	4,492	4,992	9,484	244.9	40.1	137.1
60-69	5	6	11	3,927	4,043	7,970	127.3	148.4	138.0
70-79	4	1	5	1,228	1,447	2,675	325.7	69.1	186.9
80+	3	0	3	400	716	1,116	750.0	0.0	268.8
Unk	0	1	1						
Total	32	18	50	55,134	56,227	111,361	58.0	32.0	44.9

*Unknown age

Table 3. Age-standardized Cancer Mortality Rates per 100,000 by Province

Province	Males	Females	Ratio
Phu Tho (1999-2004)	194.2	63.1	3.1
Nam Dinh (2004-2005)	152.1	53.7	2.8
Bac Kan (1999-2004)	65.1	29.5	2.2
Combined (1999-2005)	155.7	54.3	2.9
IARC estimation for Viet Nam, 2002	116.2	67.1	1.7
World-more developed regions, 2002	169.6	102.5	1.7
World-less developed regions, 2002	119.3	83.1	1.4

Provincial Health Department-Each District Health Center and each Commune Health Station was established to collect data for the present study. In this way, a comparable database of the three study population could be made. The world population structure was used to estimate age-standardized cancer mortality rates per 100,000, (ASR).

The present study examined data for all cancers combined as a pilot study to check for the feasibility, practically and reliability of population-based cancer mortality registration in the North of Viet Nam.

Results

All 230 communes of Nam Dinh province, 16 communes of whole Lam Thao district of Phu Tho province and 11 of 22 communes of Cho Don district-Bac Kan province participated in the present study. Crude death rates from all causes were 442.6, 501.6 and 377.2 for Phu Tho, Nam Dinh and Bac Kan, respectively. Crude cancer mortality rates were 101.5, 98.9 and 44.9 for these populations, respectively, (Table 1).

In Phu Tho, the number of cancer cases were 561 and 256; and crude cancer mortality rates were 143.2 and 61.9 for males and females, respectively. In Nam Dinh, number of cancer cases was 2,242 and 1,135; and crude cancer mortality rates were 135.1 and 64.7 for males and females, respectively. In Bac Kan, number of cancer cases was 32 and 18; and crude cancer mortality rates were 58.0 and 32.0 for males and females, respectively (Table 2).

In males, age-standardized cancer mortality rates were

194.2, 152.1 and 65.1 in Phu Tho, Nam Dinh and Bac Kan, respectively. In females, those were 63.1, 53.7 and 29.5, respectively. Male to female ratios were 3.1, 2.8 and 2.2, respectively. Overall, when these three populations were combined, age-standardized cancer mortality rates were 155.7 and 54.3 in males and females, respectively (Table 3). For age-specific cancer mortality rates per 100,000, a peak was seen for males at 70-79 and for females at 80+ (Figure 1).

Discussion

Crude death rates per 100,000 estimated from all causes were ranked from 420-600, average at 570 at national level (National census in 1999) and from 450-580, average at 540 at the national level in 2004 (MOH, 2004). It was 487 in the present study populations that were ranked within variable of the national estimation (MOH, 2004). The crude death rate per 100,000 in Bac Kan (377) was lower than other two provinces (443-502). Estimation of mortality rate from all causes and cancer in Bac Kan might be underestimated in this high mountain area with certain disadvantages regarding health care facilities. The completeness of registered case cases were checked by comparing the results made by the head of commune health station with the results of verbal autopsy. Some cancer cases were identified among cases with “Unknown case of deaths”. The proportion of cancer cases confirmed by verbal autopsy was 25% of all cancer cases (Tra and Dung, 2003). Underestimation of cancer might be faced for the age group 70-79 and 80+ in males because the curve was down (Figure 1). Overall, it was underestimated about 10% of all cancers in Viet Nam.

The accuracy of registered cancer cases was validated by the method of verbal autopsy previously. That is, sensitivity of diagnosed cancer made by the head of commune health station was 86% and specificity was 92% (Tra and Dung, 2003).

The present database was developed from three sources from three official Departments. Cross-check, therefore, was made to achieve the best under Viet Nam conditions. The existing network should provide a sound database for cancer mortality with advanced operation annually monitoring. This was also previously addressed for a Hanoi population (Ngoan, 2006).

The cancer risk among Vietnamese males was found to be 2.9 times higher than for females. In spite of some limitations, the present study suggested that males suffered from lifestyle-related cancers and urbanization-linked environmental cancer risk factors. In males, the age-standardized cancer mortality rate per 100,000 of the present study (155.7) was lower than more developed countries (169.6) but higher than less developed countries (119.3) (IARC, 2002). In females, it was 54.3 that was lower than both less and more developed countries (83.1-102.5) (IARC, 2002). That could be explained that Vietnamese female current smoker rate is very low at 4% (Jenkins et al., 1997). In addition, only 2% of Vietnamese females in North Viet

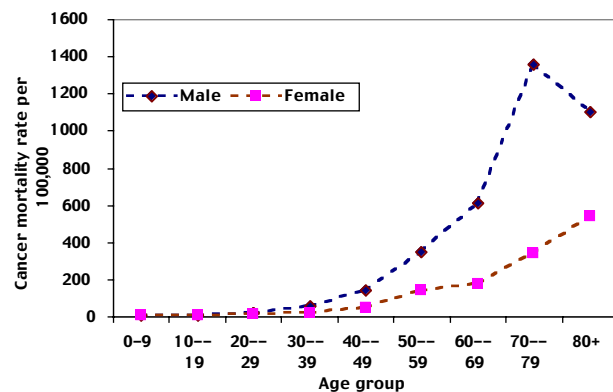


Figure 1. Age-specific Mortality Rates for the Combined Regions

Nam are exposed to HPV, as compared with 11% in females in Ho Chi Minh (Pham et al., 2003). Cervical cancer incidence among Vietnamese females in the North Viet Nam was about one fourth of females in Ho Chi Minh city (Anh et al., 1997; Ngoan et al., 2002b).

When males and females were combined, crude cancer mortality rate was 98 per 100,000. Therefore, the estimated number of cancer deaths annually during the 2000s was 78,400 cases. Scientists have estimated that about 80% of human cancer could be prevented (Doll & Peto, 1981). Efforts for cancer prevention in Viet Nam should be given high priority in the near future.

To conclude, the present findings suggest that in Viet Nam, development of reliable population-based cancer mortality registration is feasible and practical. Further analysis of individual cancer sites will be performed for the present study populations to identify the real cancer patterns and improve cancer prevention in Viet Nam.

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