

Evaluation of the Vietnamese A6 mortality reporting system: injury as a cause of death

Mark R Stevenson,¹ Le Tran Ngoan,² Dang Viet Hung,³ Nguyen Thi Huong Tu,³ Anh Luong Mai,³ Rebecca Q Ivers,⁴ Hoang Thanh Huong³

¹Accident Research Centre, Monash Injury Research Institute, Monash University, Australia

²Department of Public Health, Hanoi Medical University, Vietnam

³Ministry of Health, Hanoi, Vietnam

⁴The George Institute for Global Health, The University of Sydney, Australia

Correspondence to

Professor M Stevenson, Monash University Accident Research Centre, Monash Injury Research Institute, Monash University, Clayton, Melbourne, Vic 3800, Australia; mark.stevenson@monash.edu

Accepted 17 January 2012

Published Online First
23 February 2012

ABSTRACT

Background Despite the fact that the A6 mortality reporting system has been operating for almost 20 years in Vietnam, there has been no systematic evaluation of the system. This study assesses the completeness, sensitivity and positive predictive value of the system in relation to injury related mortality.

Methods Evaluation of the A6 system was undertaken in three (geographically distributed) provinces in Vietnam. Deaths identified in the A6 system were compared with deaths identified by an independent consensus panel to determine the per cent completeness of the A6 system. Verbal autopsies (VA) were conducted for all identified deaths from the consensus panels, and the sensitivity and positive predictive value of the A6 system were assessed using the VAs as the reference.

Results 5273 deaths were identified from the A6 system with a further 340 cases identified by the independent consensus panel (total n=5613). Injury related deaths accounted for 13.6% (n=763) of all deaths with an overall injury mortality rate of 55.3 per 100 000 person years. The per cent completeness of the A6 system in relation to injury deaths was 93.9% with a sensitivity of 75.4%, specificity of 98.4% and positive predictive value of 88.4%.

Conclusions The A6 mortality reporting system is embedded within the commune health system and is the lead mortality reporting system for the Ministry of Health. The system performs well in relation to its completeness and classification of injury related deaths. With further enhancements and ongoing support from government and donor agencies, the A6 system will be a valuable resource for identifying and planning preventive strategies targeting the leading causes of injury related deaths in Vietnam.

INTRODUCTION

The Socialist Republic of Vietnam, with an estimated population of 86 million,¹ has placed significant emphasis on economic development, particularly since the introduction of the *doi moi* (or economic reform) in 1986. As a consequence, Vietnam has achieved much in a short timeframe. For example, the percentage of the population living on less than a dollar a day has fallen from 39.9% to 4.1% over a 15 year period from 1993 to 2008, and so too have the health indices improved, with life expectancy for men now 70.2 years and for women 75.6 years.^{1,2} However, measurement of health indices is reliant on a health information system that is reliable, timely and, in the context of a low–middle income country such as Vietnam,

affordable. A national mortality reporting system is the cornerstone of such an information system and yet in many low and middle income countries mortality reporting systems either do not exist or, if they exist, have significant limitations, including misclassification of the cause of death, under-reporting, lack of timeliness or incomplete capture of mortality.³

For many countries, civil registration and vital statistics systems are considered the gold standard for mortality statistics as data on deaths recorded as a legal requirement tend to be complete.⁴ Civil registration was initiated in Vietnam in 1956 and despite the 50 years of collecting mortality data only limited information has been published.⁵ However, a recent study assessed the civil registration and vital statistics system in Vietnam and reported that the system had significant limitations, including a lack of completeness, particularly for early neonatal deaths, deaths of temporary residents and/or migrants.⁵ Importantly, the death certificate provided by the authority does not require the signature of the doctor and therefore the cause of death is poorly recorded.

Beyond Vietnam's civil registration and vital statistics system, a national mortality reporting system has also been introduced. Under the auspices of the Ministry of Health, the A6 mortality reporting system relies on commune level health officials providing basic demographic data and information on the cause of death, which is recorded in an official book referred to as the A6. Data from the A6 are collated by the district level health service and the information is then forwarded to the provincial and central level governments. The commune level officials play a significant role in maintaining the current mortality reporting system and in turn are able to actively use the information gained to plan commune level health services.

Despite this novel approach to collecting the data, there have been no systematic evaluations of the system, particularly in relation to the completeness of the reporting of mortality, sensitivity and the positive predictive value of the system. This study assesses the completeness, sensitivity and positive predictive value of the system with a focus on evaluating the national A6 mortality system from the perspective of injury related mortality. There are a number of reasons for selecting injury related mortality and these include: (1) injury is the leading cause of mortality ahead of circulatory, infectious and parasitic diseases⁶; (2) the burden of injury affects the young disproportionately in Vietnam where it accounts for approximately half of all deaths between the ages

of 2 and 49 years, resulting in serious economic and social costs likely to affect the ongoing development of the country; and (3) it is anticipated that the accuracy of the reporting in relation to injury mortality is high^{6–8} and therefore there will be direct implications for all-cause mortality reporting if the validity of the A6 system for injury related mortality has limitations.

METHODS

The study was undertaken in three provinces in Vietnam—namely, Bac Ninh, Lam Dong and Ben Tre provinces. These provinces were selected to represent the geographic distribution of Vietnam, with Bac Ninh in the northern Red Delta River region, Lam Dong in the central highlands region and Ben Tre in the southern Mekong Delta region. Bac Ninh has a total population of approximately 1 million with seven districts and 125 communes, Lam Dong has a population of 1.2 million, with eight districts and 145 communes and Ben Tre has a population of 1.4 million with seven districts and 160 communes.^{9–10} In each province, three districts were randomly selected to represent rural, suburban and city areas, and all communes in these districts participated in the evaluation ($n=140$). All methods and instrumentation used for this evaluation were approved by both the ethics committee of the Hanoi Medical University and the human research ethics committee of the University of Sydney.

Completeness of the system (as described by Silva¹¹) was assessed by comparing all deaths reported in the A6 book from the communes ($n=140$) for the observation period 1 January 2008 to 31 December 2009 (for one district in the Lam Dong province, data for the calendar period 1 January to 31 December 2008 were only available) with those reported from an independent consensus panel established for this study in each commune. In order to do this, a list of all deaths was compiled from the A6 records comprising the age and sex of the deceased, date of death and cause of death.

In parallel with the A6 mortality system, the Ministry of Justice and the General Office for Population and Family Planning collect similar data (but independent of the A6 system) on deaths occurring in the commune. The Ministry of Justice is notified of deaths, particularly to ensure deceased government workers do not continue to receive financial remuneration, while the General Office for Population and Family Planning collect mortality data merely for population census and only for those aged 18 years and younger. For the purpose of this study, both the commune justice officer and commune population family planning officer were sent a form requesting the following data from their independent systems: the deceased's name, age, sex, date of death and cause of death, and address of the deceased. Consensus panels comprising the commune health officer, commune justice officer and commune population family planning officer were established (a total of 420 commune level staff) and each member participated in a series of workshops in which a consensus was achieved on the listing of deaths in their commune for the observation period. A comparison of the deaths captured in the A6 system with those identified from the consensus panel was undertaken by the authors to estimate the per cent completeness of the A6 system.

To assess the sensitivity, specificity and positive predictive value of the A6 system, an external 'gold standard' classification of the cause of death was needed. For the purpose of this study, the standardised and validated verbal autopsy (VA) developed by the WHO was utilised.¹² To administer the VA, a team of commune health staff ($n=140$) were trained in the administration of the VA and then each field worker visited the deceased's household and administered one of three VA questionnaires; separate question-

naires were used for deaths in each of three age groups (0–28 day old infants, 29 days to <5 year old child and 5 years onwards). The instruments included a series of questions relating to various signs and symptoms of different diseases and injury, along with an open narrative section that was completed with the aid of the field worker. Cause of death assignment for the VAs was undertaken, independently, by two experienced physicians, each of whom had more than 15 years of clinical experience and who had previously worked in allocating causes of death from surveillance systems. An underlying cause of death for all cases was assigned and, wherever possible (92%, $n=5168$ cases), immediate and contributory causes of death were assigned. The cause of death was assigned from the 10th version of the International Statistical Classification of Diseases and Related Health Problems (ICD-10)¹³ and comprised approximately 54 groups of causes of death that could be confidently assigned by the experienced physicians based on the information typically provided in a VA. Assigning the cause of death was enhanced by utilising a previously developed series of algorithms.^{12–14–15} A further enhancement to the classification of cause of death was review of the medical/health records of the deceased; the majority of deaths had either a hospital or commune health station or private medical doctor (65.6%, $n=3684$). The morbidity review, which was also undertaken by the physicians, assisted when the underlying cause of death differed from the immediate cause of death. The morbidity review also assisted in cases where there was disagreement between the allocated causes of death by each physician. In the situation where there continued to be disagreement between the two medical reviewers ($n=10$), a telephone interview was undertaken with the family member who provided care to the patient just prior to death or was the parent/guardian, to elicit further information about the possible cause of death. Figure 1 outlines the process undertaken to classify the cause of death.

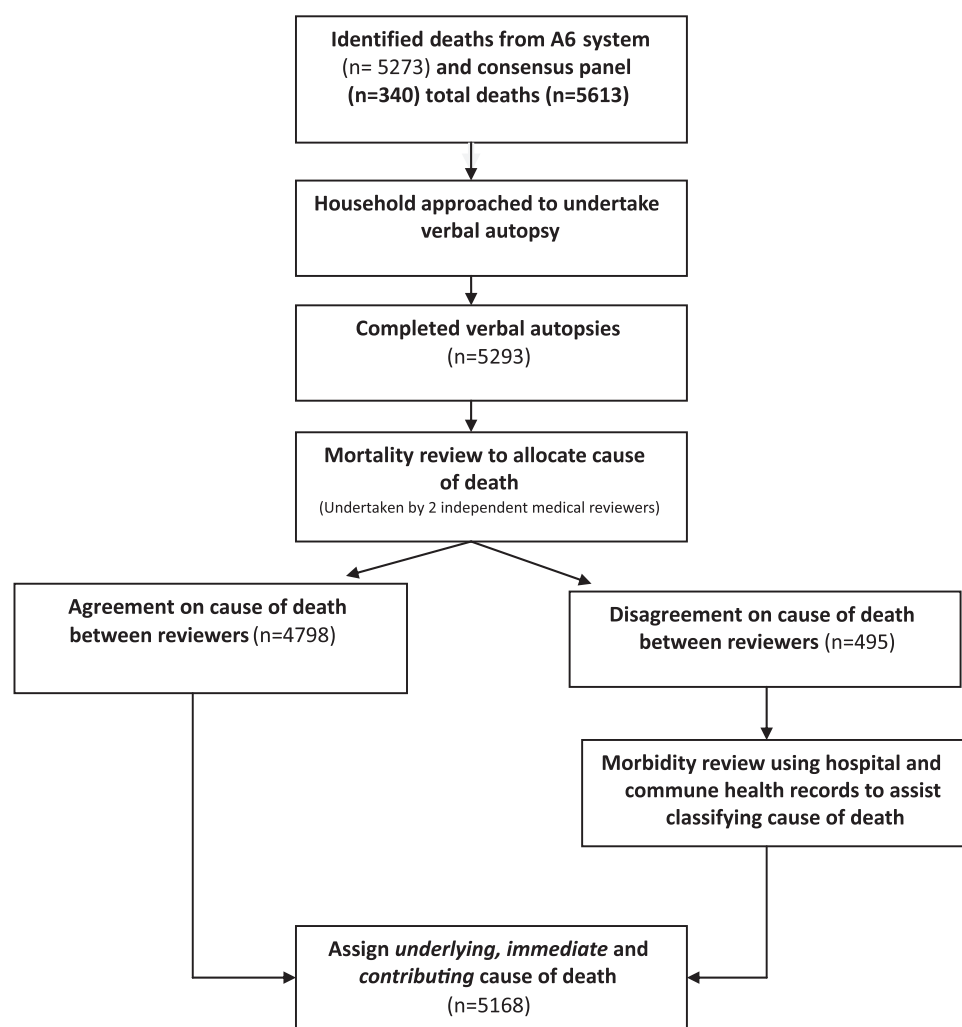
Statistical analysis

For the purpose of this study, all counts were converted to mortality rates by age and sex. The denominator for the mortality rates comprised the population of the 140 communes, including permanent residents and non-permanent residents of the commune who had lived in the commune for more than 6 months. The data were obtained from the annual population statistics from the 140 communes for 2008–2009 and verified against the estimates from the 2009 census.¹ Persons who had lived in the commune for <6 months were excluded from the denominator. To determine the agreement between the two experienced physicians' classification of the cause of an injury related death, a kappa statistic was undertaken (see table 1). The standard approach for estimating the completeness, sensitivity and positive predictive value of the A6 system, according to Silva¹¹ and Jenicek,¹⁶ was utilised. All analyses were undertaken using STATA software V.10.0.¹⁷

RESULTS

A total of 5273 deaths were identified from the A6 system during the observational period, and following the consensus panel review, a further 340 deaths were identified ($n=5613$). VAs were undertaken for all deaths identified ($n=5613$), with a total of 5293 VAs completed (94%) (see figure 1). VAs were not obtained for 320 deaths (6%) as five households in which a deceased person had resided refused to participate, 50 households did not have the head of the household available at the time of interview and for the remaining households ($n=265$) the family of the deceased had migrated to another commune (outside the study communes) and were not contactable.

Original article

Figure 1 Process for classifying cause of death.

Three hundred and twenty-three specific ICD-10 causes of death were identified for the 5613 cases, of which 85 injury related external causes of death were classified and coded to ICD-10. A total of 763 injury cases were identified, of which 94 cases were intentional injuries (12.3%) and the remaining (n=669, 85.5%) unintentional injuries. Agreement between the two independent physicians responsible for classifying the cause of death from the VAs was excellent for injury as a cause of death, with 85.5% agreement (see table 1). Injury as a cause of death accounted for 13.6% (n=763) of all deaths, with an overall mortality rate of 55.3 per 100 000 population (80.4/100 000

population for men and 31.0/100 000 population for women). Table 2 describes the cause and sex specific injury mortality rates for the 12 leading causes of injury mortality. As highlighted in table 2, road traffic injury was the leading injury related cause of death and, compared with women, men were 2.5 times more likely to die from an injury related cause.

Other than the Ba Tri district, there was little variation between the districts in relation to the completeness of the A6 system in identifying a death (see table 3). The overall per cent completeness for the A6 system was almost 94%. The ability of the A6 system to identify an injury related death was good (75.4%) and the ability of the A6 system to identify an injury related death when it was an injury related death (namely, the positive predictive value of the A6 system) was very good (positive predictive value=88.4%) (see table 4). The sensitivity of the A6 system varied by the specific injury related cause of death, with the sensitivity highest for road traffic injuries (sensitivity=95.4%) which comprised one-third of the injury related deaths and lowest for falls (sensitivity=20.4%).

DISCUSSION

The A6 mortality reporting system was established by the Ministry of Health in 1992 to obtain basic demographic data and information on the cause of death.¹⁸ The data are compiled by the commune health officer and collated by the district level health service and then forwarded to the provincial and central level governments where they are compiled for the reporting of

Table 1 Kappa agreement by cause of injury death

Injury cause of death from verbal autopsy (ICD10 code)	No	Kappa agreement (%)	p Value
Road traffic injury (V01–V99)	238	97.1	<0.05
Drowning (W65–W74)	117	94.0	<0.05
Falls (W00–W19)	108	60.2	<0.05
Suicide (X60–X84)	89	89.9	<0.05
Electrocutions (W85–W99)	37	91.9	<0.05
Work related injury (V01–V99, W00–W19, W65–W74, W85–W99, Y34)	33	90.9	<0.05
Poisoning (X40–X49)	25	48.0	<0.05
Violence (X85–Y09)	23	87.0	<0.05
Other injury cause (W20–W64, W75–W99, X00–X39, X50–X59, Y10–Y89)	59	69.5	<0.05
Total completed verbal autopsy*	729	85.5	<0.05

*Excludes 34 cases in which no verbal autopsy was completed.

Table 2 Injury mortality rates by cause of injury and sex

Cause	No			Per cent			Rate per 100 000 population		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Road traffic injury	205	52	257	37.5	24.0	33.7	30.2	7.4	18.6
Drowning*	85	36	121	15.6	16.6	15.9	12.5	5.1	8.8
Falls	50	60	110	9.2	27.6	14.4	7.4	8.6	8.0
Suicide	68	26	94	12.5	12.0	12.3	10.0	3.7	6.8
Electrocution	28	11	39	5.1	5.1	5.1	4.1	1.6	2.8
Work related injury†	29	5	34	5.3	2.3	4.5	4.3	0.7	2.5
Poisoning	24	2	26	4.4	0.9	3.4	3.5	0.3	1.9
Violence	21	2	23	3.8	0.9	3.0	3.1	0.3	1.7
Drug overdose	18	2	20	3.3	0.9	2.6	2.7	0.3	1.5
Burns	1	3	4	0.2	1.4	0.5	0.1	0.4	0.3
Animal bites	2	0	2	0.4	0.0	0.3	0.3	0.0	0.1
Other causes	15	18	33	2.7	8.3	4.3	2.2	2.6	2.4
Total	546	217	763	100	100	100	80.4	31.0	55.3

*Not including work related drowning and falls.

†Deaths from road traffic injury on the way to or from the workplace were removed from this category (n=34 (4.5%) of deaths).

the country's annual mortality statistics. The strength of the A6 mortality reporting system is its simplicity. The A6 system is established in all communes (n=10 769)¹⁹ in Vietnam with the recording of deaths of commune residents easily applied by all commune health officers (of which 65% of commune health stations have a medical doctor).^{10 20–22} Unlike mortality data collected by the Ministry of Justice and the Office of Population and Family Planning, the A6 system is the only mortality reporting system in the country in which the classification of the cause of death is provided by staff qualified to classify such.

Until now, the A6 mortality reporting system had not been evaluated and the findings from this study, albeit related to injury related mortality, suggest that the per cent completeness of the system is excellent. We also found that the A6 system has good sensitivity for most injury related deaths—that is, it is accurate in recognising injury deaths (although there is some variation between injury related causes, with the sensitivity of the A6 system low for falls and poisonings). The positive predictive value of the system was high, indicating that if the death was classified as an injury death, there was 88% likelihood that the death was truly an injury related death. Although the evaluation did not set out to estimate robust injury mortality rates, the estimated road traffic injury mortality rates based on the sample for the study (18.6 per 100 000 population) falls within the WHO estimate for road traffic injury mortality in Vietnam (road traffic injury mortality rate 16.3–19.0/100 000)²³ Also, the overall proportion of deaths attributed to an injury in

the A6 system of 13.6% is similar to previously cited studies in which VA verified causes of death have been used in Vietnam. For example, VA verified causes of death in the Bavi District estimated the overall proportion of injury related deaths as 13.8% of all deaths.²⁴

Despite these findings, it is important to note a number of limitations associated with the study. The first relates to the potential for misclassification of the cause of death when using VAs, which we used as a 'gold standard' for the evaluation.^{14 15} Much has been reported on the potential to misclassify some causes of death. We were very aware of these limitations and assessed the agreement between physicians in assigning injury related cause of death. As evident from our findings, the overall agreement was very good although there was clearly high discordance in relation to the cause of death for falls and poisoning which concurs with other studies^{14 15 24} and points to the need for specific training in relation to attributing the cause of death related to a number of injury causes.

Over the past 10 years, a number of international donor agencies have supported injury surveillance projects in Vietnam in an effort to enumerate both injury mortality and morbidity; however, many of these have been linked to provincial level activities.^{3 6} A number of these projects have provided valuable estimates of injury related morbidity⁶ but seldom any reliable estimate of injury mortality. A critical element of many of these surveillance projects is that they have diverted needed funds away from the existing reporting systems, like the A6 mortality reporting system which, on the basis of the findings from this evaluation, has the rudiments of an excellent surveillance system in relation to reporting injury mortality.

Despite the per cent completeness, sensitivity and positive predictive value of the A6 system in relation to injury mortality, there are limitations with the ongoing administration of the

Table 3 Completeness of A6 system by province and district: all causes

Region		Consensus panel Deaths (n)	A6 system Deaths (n)	Completeness %
Province	Districts			
Bac Ninh (North)	Bac Ninh city	736	686	93.2
	Yen Phong	537	503	93.7
	Thuan Thanh	741	728	98.2
	Total districts	2014	1917	95.2
Lam Dong (Central)	Da Lat city	699	656	93.8
	Don Duong	671	642	95.7
	Bao Lam	266	249	93.6
	Total districts	1636	1547	94.6
Ben Tre (South)	Ben Tre city	516	497	96.3
	Cho Lach	578	566	97.9
	Ba Tri	869	746	85.8
	Total districts	1963	1809	92.2
Total		5613	5273	93.9

Table 4 Sensitivity and positive predictive value

A6 system	Determined by verbal autopsy		Total
	Injury	No injury	
Injury	(TP) 550	(FP) 72	622
No injury	(FN) 179	(TN) 4492	4671
Total	729	4564	5293

Sensitivity: $(550 \times 100) / (550 + 179) = 75.4\%$.Specificity: $(4492 \times 100) / (4492 + 72) = 98.4\%$.Positive predictive value: $(550 \times 100) / (550 + 72) = 88.4\%$.Negative predictive value: $(4492 \times 100) / (4492 + 179) = 96.2\%$.

FN: false negative; FP: false positive; TN: true negative; TP: true positive.

Original article

What is already known on the subject

- Civil registration and vital statistics system in Vietnam has significant limitations.
- No evaluation of the A6 mortality reporting system in Vietnam (a health system based reporting system) has been undertaken in relation to enumerating injury mortality.

What this study adds

- The A6 system performs well in relation to its completeness and classification of injury related deaths.
- With further enhancements, the A6 system will be a valuable resource for identifying and planning preventive strategies targeting the leading causes of injury related deaths in Vietnam.

system which will require considerable support from government and international agencies. First, the A6 mortality reporting system has not yet integrated the ICD-10 coding protocols into the system and, as yet, does not assign an underlying, immediate and contributing cause of death (as we did in this evaluation). Also, the commune and district level staff who are involved with the collation and presentation of the A6 data have limited access to training and/or support. The most significant concern however, was the fact that the A6 system, until recently, was a passive surveillance system with only data collected by the commune justice officer comprising an active surveillance system. The problem with the latter is the fact that the mandatory reporting of a death is presided over by someone not qualified to classify a cause of death. It was critical therefore that the A6 mortality system did not remain a passive surveillance system. The Ministry of Health in Vietnam acknowledged a number of these limitations and recently elevated the A6 system²⁵ to an active surveillance system and this is supported by the fact that since this year all commune health officers receive a salary from the local government to ensure they provide mortality data on a weekly basis which is forwarded on a monthly basis to provincial and central level government.²⁶

CONCLUSION

The A6 mortality reporting system is embedded within the commune health system which partially explains one of the key strengths of the A6 system (in relation to injury mortality)—namely, its completeness. It is also important to highlight that this is achieved at a low cost (total cost is accommodated in the Office of Preventive Medicine's (Ministry of Health) annual budget). Given the validity of the A6 in relation to injury mortality and the recent enhancements to the administration of the system, the findings from the evaluation indicate that the A6 mortality reporting system is a valid system for enumerating injury related mortality. Consequently, the system could comprise the foundation on which future sentinel surveillance and associated research is conducted, thereby providing an opportunity to monitor emerging injury related mortality at the provincial levels in Vietnam. Of concern however are the limitations identified in relation to fall and poisoning related deaths. These limitations are an indicator that the A6 system will require validation from the perspective of all-cause mortality.

Acknowledgements The authors deeply appreciate the Management/Advisory Board for the study—namely, Nguyen Duc Vinh, Nguyen Thi Bich Lien, Tran Nhu Nguyen, Nguyen Phuong Hoa, Nguyen Thi Lua, Lai Thi Minh Hang, Nguyen Quynh Mai (HMu) and Nguyen Dinh Tam (Bac Ninh), Pham Thi Bach Yen (Lam Dong) and Nguyen Van Thang (Ben Tre). The authors acknowledge the numerous officers of the three provincial health departments; officers of the nine district health centres; and the 420 commune health workers, justice and population family planning officers who participated in the present study.

Contributors All authors conceived the design, assisted with interpretation of the data, drafting of the article and final approval of the paper. MRS and LTN also acquired the data and analysed the data.

Funding The study was supported by an AusAID Research Development Grant. MRS is supported by an NHMRC Fellowship and RQI is supported by an NHMRC Career Development Award.

Competing interests None.

Patient consent Obtained.

Ethics approval The study was approved by the ethics committee of the Hanoi Medical University and the human research ethics committee of the University of Sydney.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

1. **GSO.** *The 2009 Vietnam population and housing census: major findings.* Hanoi: General Statistics Office of Viet Nam, 2009.
2. **UN.** *MDG Summit 2010-Viet Nam. Summit on the millennium development goals.* Hanoi: United Nations, 2010.
3. **HMN.** *Health metrics network: a framework and standards for country health information system development.* Geneva: World Health Organization, 2006.
4. **United Nations.** *Principles and recommendations for a vital statistics system, revision 2.* New York: NY: United Nations Statistical Commission, 1999.
5. **Rao C, Osterberger B, Anh TD, et al.** Compiling mortality statistics from civil registration systems in Viet Nam: the long road ahead. *Bull World Health Organ* 2010;**88**:58–65.
6. **Anh LV, Linh LC, Cuong PV.** *Viet Nam multi-center injury survey (VMIS - Report in Vietnamese).* Hanoi: Hanoi School of Public Health, 2003:33.
7. **Murray CJ, Lopez AD.** Global and regional cause-of-death patterns in 1990. *Bull World Health Organ* 1994;**72**:447–80.
8. **Tra LN, Dung TV.** *Study on cause of death at Soc Son District.* Hanoi city, Hanoi: Hanoi Medical University, 2003:53.
9. **GSO.** *Socio-economic statistical data of 671 districts, towns and cities under the authority of provinces in Vietnam.* Hanoi: Statistical Publishing House, 2006.
10. **Ministry of Health.** *Health statistics yearbook, 2008: injury mortality by regions/causes/provinces.* Hanoi: Ministry of Health, 2009.
11. **Silva IDS.** *Cancer epidemiology: principle and methods.* Lyon, France: IARC, WHO, 1999.
12. **WHO.** *Verbal autopsy standards: ascertaining and attributing causes of death.* Geneva, Switzerland: World Health Organization, 2007.
13. **WHO.** *International Statistical Classification of Diseases and Related Health Problems, 10th revision.* Geneva: World Health Organisation, 2003.
14. **Soleman N, Chandramohan D, Shibuya K.** Verbal autopsy: current practices and challenges. *Bull World Health Organ* 2006;**84**:239–45.
15. **Yang G, Rao C, Ma J, et al.** Validation of verbal autopsy procedures for adult deaths in China. *Int J Epidemiol* 2006;**35**:741–8.
16. **Jenicek M.** *Epidemiology: the logic of modern medicine.* Montreal: EPIMED International, National Library of Canada, 1995.
17. **STATA.** Statistical software, statistics, data management. Release 10. College Station, Texas: STATA Press, 2008.
18. **Ministry of Health.** *Decision No 822/BYT.QD to issue mortality reporting book A6/YTCS.* Hanoi: Ministry of Health, 1992.
19. **Ngoan LT, Lua NT, Hang LT.** Cancer mortality pattern in Viet Nam. *Asian Pac J Cancer Prev* 2007;**8**:535–8.
20. **Ministry of Health.** *Health statistics yearbook, 2005-2006: injury mortality by regions/causes/provinces.* Hanoi: Ministry of Health, 2007.
21. **Ministry of Health.** *Health statistics yearbook, 2007: injury mortality by regions/causes/provinces.* Hanoi: Ministry of Health, 2008.
22. **Ministry of Health.** *Health statistics yearbook, 2009: injury mortality by regions/causes/provinces.* Hanoi: Ministry of Health, 2010.
23. **WHO.** *World report on road traffic injury prevention: summary.* Geneva: World Health Organization, 2004.
24. **Huong DL, Minh HV, Byass P.** Applying verbal autopsy to determine cause of death in rural Vietnam. *Scand J Public Health Suppl* 2003;**62**:19–25.
25. **Ministry of Health.** *Decis No 2554/BYT.QD issue mandatory active registration developing health information commune health station, district health center provincial health department.* Hanoi: Ministry Health, 2002.
26. **Prime Minister.** *Decision No 75/2009/QĐ-TTg to pay subsidization to village health worker.* Hanoi: Ministry of Health, 2009.



Evaluation of the Vietnamese A6 mortality reporting system: injury as a cause of death

Mark R Stevenson, Le Tran Ngoan, Dang Viet Hung, Nguyen Thi Huong Tu, Anh Luong Mai, Rebecca Q Ivers and Hoang Thanh Huong

Inj Prev 2012 18: 360-364 originally published online February 23, 2012
doi: 10.1136/injuryprev-2011-040261

Updated information and services can be found at:
<http://injuryprevention.bmj.com/content/18/6/360>

These include:

References

This article cites 6 articles, 1 of which you can access for free at:
<http://injuryprevention.bmj.com/content/18/6/360#BIBL>

Email alerting service

Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Topic Collections

Articles on similar topics can be found in the following collections
[Epidemiologic studies](#) (838)

Notes

To request permissions go to:
<http://group.bmj.com/group/rights-licensing/permissions>

To order reprints go to:
<http://journals.bmj.com/cgi/reprintform>

To subscribe to BMJ go to:
<http://group.bmj.com/subscribe/>