TRIAL OF MEDICAL CERTIFICATE OF CAUSE OF DEATH (SMPK) TO IMPROVE THE QUALITY OF RECORDING AND REPORTING HOSPITALS MORTALITY DATA IN JAKARTA, YEAR 2007[1]

Sarimawar Djaja[2], Lamria Pangaribuan[2], Tin Afifah[2], Soewarta Kosen[2], dan C. Rao[3]

ABSTRAK

Statistik kematian sangat penting untuk memberikan informasi dasar tentang kesehatan masyarakat. Di Indonesia, pencatatan dan pelaporan penyebab kematian masih merupakan masalah, disebabkan antara lain belum adanya standardisasi pelaporan kejadian kematian di rumah sakit (RS) dan di rumah. Pada tahun 2005, Badan Litbangkes berkolaborasi dengan WHO dan SPH, University of Queensland mengembangkan Sertifikat Medis Penyebab Kematian (SMPK) untuk Provinsi DKI Jakarta berdasarkan ICD-10. Penggunaan SMPK oleh rumah sakit ditetapkan dengan Surat Keputusan Kepala Dinas Kesehatan Propinsi DKI Jakarta No.3942/2006. Uji coba dilakukan dengan melatih dokter mengenai konsep underlying cause of death (UCOD) untuk mengisi SMPK, dan memeriksa setiap SMPK dari pasien rawat inap yang meninggal di RS Sint Carolus dan Pasar Rebo sepanjang tahun 2007. Pemeriksaan terhadap jumlah, kelengkapan, dan keakuratan pengisian SMPK oleh dokter dilakukan oleh peneliti Badan Litbangkes. Hasil menunjukkan bahwa tanggapan dokter mengisi SMPK di Sint Carolus lebih baik daripada di Pasar Rebo (791 vs. 321 SMPK). Di ke dua RS, kira-kira 90 persen keterangan tentang selang waktu sakit sampai meninggal tidak diisi. Beberapa hal yang tidak akurat seperti mode of dying yaitu respiratory failure (J96.9), cardiac arrest (I46.9), dan pneumonia unspecified (J18) dicatat sebagai penyebab kematian. Untuk meningkatkan kualitas pencatatan penyebab kematian, semua dokter harus diberikan pelatihan penyegaran, dan diinformasikan mengenai hal-hal yang tidak akurat yang harus dihindari sebagai UCOD sesuai konsep ICD-10. Perekam medis juga harus dilatih khusus untuk pengkodean dan penentuan UCOD final dengan menggunakan Medical Mortality Data System.

Kata kunci: *Uji Coba, Sertifikat Medis Penyebab Kematian*

INTRODUCTION

Mortality statistic is essential to provide basic information on the status of a population's health (Beaglehole P, R. Bonita, T. Kjellstorm, 1993). Cause of death data are a vital component of a population's epidemiological profile. Reporting of all-cause mortality levels, while an essential aspect of population health, require an accompanying cause-specific profile for the development of targeted intervention, health polices and programs, and program evaluation. The most appropriate method to provide timely and reliable cause of death statistics is a complete civil registration system with accurate physician certification of cause of death.

Mortality registration systems which provide certified cause of death data are common throughout the developed countries. United States has operated a decentralized vital statistic system as an essential component in public health for more than a hundred years, which the national vital statistics systems provides nearly complete, continuous, and comparable (Rothwell CJ, 2004).

Even though the Ministry of Home Affairs (Directorate General of Population Administration) has developed a new guideline for vital registration in 2003, the mortality data collection procedure has not yet run well (Rajagukguk, 2003) and there is no specific instruction on reporting cause of death. At this time in Indonesia, the recording and reporting mortality data are still a serious problem (Rao & Lopez 2004, Oye-Gardiner & Gardiner, 2002), because the mortality registration system does not provide data

[1] Makalah ini telah dipresentasikan pada Seminar Understanding Mortality Data 2008, Queensland University of Technology, Brisbane, Australia, pada tanggal 24 November 2008

[2] Badan Penelitian dan Pengembangan Kesehatan, Departemen Kesehatan RI

[3] School Population Health, University of Queensland, Brisbane

to meet the above information needs at national and sub-national levels.

On the other hand, Ministry of Health does not have yet a national rule for recording and reporting cause of death for every death cases that occur in hospitals and those that occur at home, even though they need the data. Due to the lack of reliable cause of death data from the registration system and health information system as well, other sources have been used to provide estimates of causes of death in Indonesia. Through the Household Health Survey (Surkesnas) 1992, 1992, 2001, and Baseline Health Research (Riskesdas) 2007 using verbal autopsy methods in a sample of households to ascertain the leading cause of deaths. However, mortality survey data has many limitations such as under reporting data resulted in lack of memory from retrospective death events, inadequate skills in cause of death certification resulted in high proportion of deaths being assign ill-defined, and finally limiting the utility of these data.

The development of a mortality registration system in Indonesia is important given the decentralization of former central government authority in Indonesia recent years. The provision of local data on mortality levels and causes of death, as well as the involvement of local government officials in data collection and reporting, is vital to provide accurate and timely data to the over 440 districts governments that have received increased powers over policies and programs. Data sources that only provide information at the national level are insufficient for local governments.

In response to this need, at year 2005, National Institute of Health Research and Development (NIHRD) collaborated with World Health Organization (WHO) and School of Population Health; University of Queensland in Indonesian Mortality Registration System Strengthening Project (IMRSSP) developed a revised framework for registration of mortality and cause of death. One of these activities designed a Medical Certificate of cause of Death/Sertifikat Medis Penyebab Kematian (SMPK) for three project sites (Jakarta, Solo, Pekalongan district). Formerly, Jakarta used Form-A for recording the cause of death in every death event, based on single cause of death. Now, we revised the Form-A, namely *Sertifikat Medis Penyebab Kematian*, based on the WHO recommended format of the SMPK described in the International Statistical Classification of Diseases and Health Related Problems, 10th Revision (ICD-10). The SMPK using the multiple cause of death concept which the Underlying Cause of Death (UCOD) should reported for statistic calculation (WHO, 2003). The application of the new format of SMPK was to be carried out by hospitals in accordance with the Decree of Head of Health Office Jakarta Province No.3942/2006. Socialization of the new format of SMPK has been conducted twice first in 2006 to 80 hospitals, and second in 2007 to 72 hospitals at Jakarta Province.

This SMPK (see attachment) has been trialed at two hospitals i.e. *Sint Carolus* (private) hospital in Central Jakarta and *Pasar Rebo* (government) hospital in East Jakarta for deaths that occurred at these health facilities during one year 2007. The purpose of this trial is to know the response, the completeness, the correctness, and the pattern of cause of death from SMPK filled in by the doctors from the two hospitals.

METHOD

The samples were all deaths from two hospitals that occurred in each unit of internal, pediatric, surgery, neurology, obstetric etc during the year 2007. First, all of the heads of wards (nurses) and the coders had been trained about the format of the SMPK and their responsible to fill the identity of the corps. The medical doctors had been trained on the concept of the underlying cause of death (UCOD) and the way to fill the caused of death on SMPK at the beginning of the trailed. All the trainers were researchers from NIHRD.

Then, the paramedics responsible to fill the section of general information i.e. hospital name, month and year of death record, death record number, and the two section of the SMPK that is 1) the identity of the corpse, 2) death case at home or death on arrival section. Part one of the third section explains the sources of information to diagnose the cause of death based such as medical record, forensic autopsy, and the part two contains groups of the cause of death i.e. highly infectious diseases (SARS, Avian Flu, and Anthrax), infectious diseases, non-communicable diseases, maternal deaths, perinatal disorders, symptoms, signs and abnormal clinical and laboratory findings, Not Elsewhere Classified (NEC), and injuries caused by transport accident, occupational accident, and others accident responsible to fill by the doctor. General information and the three sections in page

one is carbonized to the other pages, this page one of the SMPK given to the family of the deceased, to get directly the permission letter from *Kelurahan* office to buried or cremated the deceased.

The doctors, who have been training about the concept of cause of death based on ICD-10, responsible to fill the detailed diseases or conditions of cause of death diagnoses in the part 3 of the third section of the second page, to determine the UCOD based on the summary of the medical record or other records, and finally to sign the SMPK. The SMPK of each ward was collected and transferred to medical record unit, to be coded according to diseases/condition based on ICD-10 (WHO, 1993) by the coder, then recorded it in the computer, and reported to Provincial Health Office and NIHRD.

For one year activities, the researcher of NIHRD received the third page of the carbonized SMPK, first they checked all the SMPK that had been filled in by the paramedics for the identity, by the doctors for the caused of death, and by coders for ICD-10 code of diseases or condition. Finally, the researcher determined the final UCOD with using the Medical Mortality Data System (MMDS).

RESULT AND DISCUSSION

The average number of death from Sint Carolus hospital is 60–70 cases per month, and Pasar Rebo hospital is higher about 80-90 cases per month. In the year 2007 *Sint Carolus* hospital reported 791 deaths, and *Pasar Rebo* hospital reported 321 deaths. The report of Sint Carolus in 2007 is more likely accurate, while from Pasar Rebo is under report. This is probably because not all the doctors in Pasar Rebo have a good response in filling the SMPK. We still can not trace the underreported cases because of the reporting system in the hospital itself has not established yet.

For the completeness, almost of all the SMPK from two hospitals were not filled in with the number of population *(Nomer Induk Kependudukan/NIK)*, the number of family card *(Nomer Kartu Keluarga)*; Pasar Rebo did not fill in the place/date of birth, the address, the age at the time of death higher than Sint Carolus (25 percent vs. 10 percent). This incompleteness is because any patients did not give complete information about their personal data or their *Kartu Tanda Penduduk* did not explained completely when gaining admission to hospital. The doctors from the Sint Carolus hospital included the mode of dying, such as cardiac arrest (I46.9), respiratory failure (J96.9) as cause of death. There was also a number of respiratory failure (J96.9) and unspecified cause of death such as pneumonia unspecified (J18) entered on SMPK by doctors from Pasar Rebo. Again, about 90 percent doctors from those two hospitals did not filled in the approximate interval between onset and death of every caused of death. For about two percent doctors from both two hospitals could not diagnose the UCOD, only diagnosed as symptoms, signs, abnormal clinical findings NEC (Table 1). The reasons of those conditions were the patient had died before the doctor examined completely, or some death cases were complicated which needed a team of doctors to decide the cause of death. The advantage of doctors mastering the WHO format of SMPK is that they can include more pathological and physiological details of the clinical sequence of events that lead to the death of their patient. Combined with ICD-10 mortality coding training to interpret and code the UCOD should result in a reduction in the number of UCOD attributed to non-specific causes and mode of dying causes.

Actually, SMPK based on ICD-10 attached in medical record of Sint Carolus hospital, but many of the doctors did not fill in if the patient died, they prefer to fill in the column for patient admission. In year 2007 *Sint Carolus* hospital initiated to invite the NIHRD researchers to re-trained their doctors about the concept of the multiple causes of death, including the UCOD and the compulsion to fill the SMPK as their professional responsibility. This refresh training was conducted to remind them of the above mentioned and to cover doctors who had not been exposed in first training. The medical director of *Sint Carolus* hospital is more cooperative to apply the new SMPK adapted with ICD-10 format, this is proved by their response to filled in the SMPK and initiating to re-train their doctors.

The important challenge to fill the SMPK completely depends on the Medical Director of the hospital applies the rules of recording and reporting the cause of death data to their staff (General Practice and Specialized doctors), the commitment of the doctors to share their time to write a summary of the medical record of every death case which consist of the history of the diseases, the physical and laboratory examination,

others supporting examination and finally the cause of death of the deceased which doctor took care of her/him before died.

Distribution of death cases from those two hospitals that is: the highest percentage of death cases in *Sint Carolus* hospital was 65 years of age and up (43.1 per cent), while in *Pasar Rebo* was only 20.2 per cent. On the other hand, the highest percentage of death cases in *Pasar Rebo* hospital was 15-44 years of age (29 per cent), while in *Sint Carolus* hospital was only 16.1 per cent. At *Pasar Rebo* hospital there are many death cases of under five years of age (13.4 per cent) compared to those of *Sint Carolus* hospital (5.8 per cent) (Figure 1).

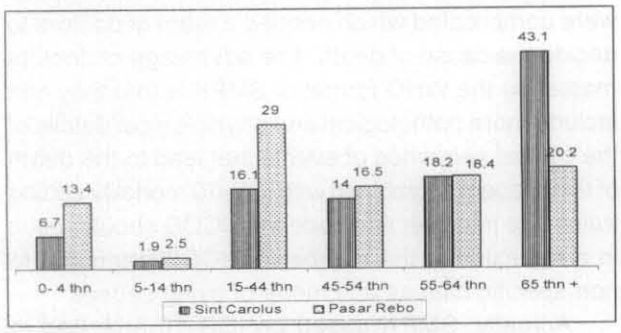

Figure 1. Percentage of Distribution of Death Using SMPK from Two Hospitals as Trialed Sample in Jakarta, Year 2007

For tabulation of the UCOD we use two types of ICD-10 Mortality Tabulation List that is: list 2 for general mortality and list 4 for infant and child mortality (WHO,1993). Figure 2 shows the cause distribution of deaths in *Sint Carolus* hospital and *Pasar Rebo* hospital, by three mayor cause groups: communicable diseases (including maternal, perinatal, and nutritional), non communicable diseases and injuries. In both location non-communicable diseases were the majority cause of death, 68 percent in *Sint Carolus* hospital and 56 percent in *Pasar Rebo* hospital. Death due to communicable diseases showed a higher percentage of deaths in *Pasar Rebo* hospitals (39 per cent) than those in *Sint Carolus* hospital (31 percent). For injury as a cause of death, a much higher percentage of deaths (5 per cent) were found in *Pasar Rebo* hospital than in *Sint Carolus* (1 per cent). This finding suggests that many patients with non-communicable diseases were hospitalized at *Sint Carolus* hospital which is located in the Central Jakarta, while those with communicable diseases were more likely hospitalized at *Pasar Rebo* hospital, located at the outskirts of East Jakarta (Figure 2).

The result of mortality study on National Health Survey 2001, showed that Indonesia has now been facing in the epidemiological transition condition, in which the proportion of non communicable disease has increased continuously since 1992, even though communicable diseases were still high in the population. Accordingly Indonesia is now facing double burden of diseases and the polarization of non-communicable and communicable diseases will last for a long time, especially in East Indonesia where access to health facilities is more difficult and the socio-economic condition is lower than that in Java-Bali (Djaja, S, 2003). Diseases pattern from those two hospitals in Jakarta tends the non-communicable diseases will increase, and the communicable disease

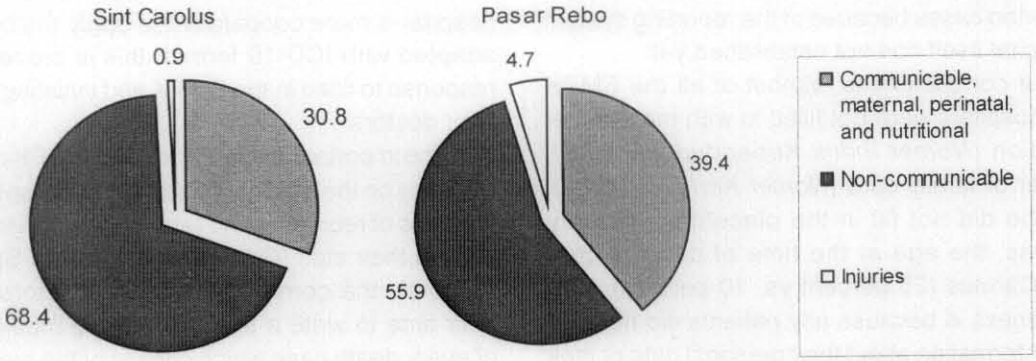

Figure 2. Leading Causes of Deaths from Two Hospitals as Trialed Sample in Jakarta, Year 2007

is still high, it was look like the models of the 2001 Mortality National Health Survey data.

From the 10 leading of UCOD at *Sint Carolus* hospital, the three highest cause of death reported consecutively were cerebral-vascular diseases (I61-I64, I67, I68) 15.7 percent, carcinoma malignant (C11-C95) 13.1 percent, diabetes mellitus with complication (E10-E11, E14) 8 percent. Certain conditions originating in the perinatal period (P00-P96) was reported 3.4 percent. While, the 10 leading of UCOD at *Pasar Rebo* hospital, showed consecutively tuberculosis (A15,16,19) 14.6 percent, cerebral-vascular diseases (I61,64) 11.2 percent, and ischemic heart disease (I21,25) 10.9 percent. No certain conditions originating in the perinatal period was reported (Table 1).

CONCLUSION

- The response of the doctors filled in the SMPK higher in Sint Carolus hospital.
- The completeness of the doctors filled in the SMPK higher in Sint Carolus hospital than in Pasar Rebo hospital.
- The correctness of the doctors filled in the SMPK higher in Sint Carolus hospital than in Pasar Rebo hospital.
- Disease pattern from Sint Carolus and Pasar Rebo hospitals in Jakarta tend the non-communicable diseases will increase, and the communicable diseases are still high in Pasar Rebo hospital.
- To maintenance and to improve recording and reporting of cause of death in those two hospitals

Table 1. The Pattern of the Underlying Cause of Death Using SMPK from Two Hospitals as Trialed Sample in Jakarta, Year 2007

No	UCOD	ICD-10 Code	St. Carolus (n = 791)	Pasar Rebo (n = 321)
1	Cerebral vascular diseases	I61.9, 62.9, 64, 67.9	15.7	11.2
2	Carcinoma malignant (including leukemia)	C11,18, 20,22,24-26 C31, 34, 41, 50, 53, C55-56, 76, 81, C85, 94-95	13.1	4.3
3	Diabetes mellitus	E11-E14.1-14.9	8.0	3.4
4	Other heart disease	I27, 46, 48-51	7.2	4.0
5	Pneumonia	J18, J18.0, J18.9	6.6	4.0
6	Ischemic heart disease	I21.9, 23, 24.9-25, 27	5.9	10.9
7	Remainder disease of respiratory system	J80, 90, 91, 94, 96	5.1	2.8
8	Septicemia	A41	4.6	3.7
9	Hypertensive diseases	I11, 12	3.3	5.3
10	Diseases of liver	K74, 80, 81	3.3	1.9
11	Perinatal condition	P07, 21, 22, 27, 28, Q03, 28, 33, 36, 39	3.4	0.0
12	Tuberculosis	A15, 16	2.9	14.6
13	HIV	B20, 24	2.1	0.9
14	Dengue hemorrhagic fever	A91	1.4	4.0
15	Chronic lower respiratory disease	J44. J45	1.9	3.1
16	Other direct obstetric death	O15, O72, O85, O86	0.1	1.6
17	Traffic accident	V99, W85	0.8	4.7
18	Renal Failure	N17-N20	4.7	4.4
19	All other diseases	D17, 25, 33, 48, E05, E86, 87, G70, 80, 82, G91, G93, K12, 29, K56, 80-82, 85, L51, 93, N18	4.1	3.4
20	Symptoms, signs, abnormal clinical findings NEC	R6, 10, 19, 40, 56-57 R96, 99	1.5	1.9

depend on the commitment of Hospital Medical Director, Medical Committee, and all doctors to do their task.

SUGGESTION

Province health office should provide training for the principle of Medical Committee in all hospital at Jakarta to fill in the SMPK and also ICD-10 mortality training for coders at hospitals, to supervise the coders in Medical Recorders Units, and to re-check the UCOD that they have been determined and give feed back of their work.

Province health office should provide the flow of recording and reporting system, start from the hospital, *Suku Dinas Kesehatan*, and make it manageable on province level. Also, they should design a standard form for reporting the cause of death by hospital every month.

Ministry of Health should make a national policy and rules to be applied in every district/city for death registered system which occurred in health facilities (hospitals), forensic department, and at home. Again, the Ministry of Health should consider the completeness of recording and reporting of SMPK in hospital as one of the requirements to reach the International Standard of Organization (ISO) predicate for improving their quality.

ACKNOWLEDGEMENT

Praise and thanks to Lord Almighty, that we can develop the new SMPK based on ICD-10 for Jakarta Province, allowing the need of complete mortality data for planning, intervening, and evaluating their program.

We would like to extent our greatest gratitude to Dr. Chalapati Rao, MPH from School of Population Health, University of Queensland, as an advisor at the IMRSSP which was funded by AusAID. Our abundance of thankfulness and highest respect to Sue Walker and Garry Waller, the Director and the Senior Classification Advisor, National Center for Classification in Health (NCCH), Queensland University of Technology, Brisbane, who has educated us in ICD-10 mortality coding, to complete our skill to run this project well.

And last but not least, we would like to thank to Dr. Harry Yusuf Rumantir and Dr. Novi, Head of Medical Record Unit in Sint Carolus and Pasar Rebo hospital and to all of those who have been either directly or indirectly involved in this project.

REFERENCES

Beaglehole R, R. Bonita, T. Kjellstorm. 1993. *Basic Epidemiology,* WHO Geneva.

Djaja S, S. Soemantri, Joko Irianto. 2003. The Course and Its Implication of the Epidemiological Transition in Indonesia. Mortality Study of the National Household Health Surveys (1986-2001). *Bulletin of Health Studies, NIHRD* Vol 31(3): 119–130.

Oye-Gardine M and P. Gardiner. 2002. *Reform of Citizen Administration in Indonesia: Results of the National Conference on Improving Public Services in Citizen Administratio.*, Kementerian Pendayagunaan Aparatur Negara dan Departemen Dalam Negeri, Repubic of Indonesia, Jakarta.

Rajagukguk O. 2003. *Death Rate and Rapid Assessment on Situation in DKI Jakarta.* Jakarta, Demographic Institute, Economy Faculty of University of Indonesia.

Rao C and AD. Lopez. 2004. *Mortality Registration Systems in Indonesia: Research Activities to Improve Cause of Death Reporting Mechanisms.* A report submitted to the Department of Health and Ageing, Commonwealth of Australia, Canberra. University of Queensland

Rothwell CJ. Reengineering vital registration and statistics system for the United States. Prev Chronic Dis [serial on line] 2004 October [cited 2009 March 28]. Available from URL: http://www.cdc.gov/pcd/issues/2004/oct/04_0074.htm.

WHO. 1993. *International Statistical Classification of Diseases and Health Related Problems-Tenth Revision.* Volume 1. Geneva: World Health Organization.

WHO. 1993. *Mortality: guidelines for certification and rules for coding. International Statistical Classification of Diseases and Health Related Problems-Tenth Revision.* Volume 2: Instruction Manual. Geneva: World Health Organization.