Mahidol University
Institute for Population
and Social Research

Experience with dual-registration validation studies in Thailand

Patama Vapattanawong, PhD (Demography)

Institute for Population and Social Research, Mahidol University,
THAILAND

UN-EGM on the Methodology and Lessons Learned to Evaluate the Completeness and Quality of Vital Statistics Data from Civil Registration

New York: 3-4 November 2016

Outline

- Thailand vital registration system (VRS) in brief
- Method used to evaluate the completeness of Thailand VRS
- Experiences of applying dual records method to different settings
- Lessons learned from those experiences

Thailand vital registration system (VRS) in brief

Civil registration system (CRS) is the main sources of vital statistics (VS) in Thailand

1909: the 1st law related to the creation of population listing throughout the kingdom was enacted.

1917: enforced births and deaths registration.

1956: the new comprehensive law, the Civil Registration Act B.E. 2499, was enacted and applicable throughout the country.

1982: the Population Identification Number Projected had been implemented (13-digit number)

1982-1988: transfer housing & population registration data from paper-based to computerized system

1991: the revised law, the Civil Registration Act B.E. 2534, was passed

The Bureau of Registration and Administration (BORA), Department of Local Administration, Ministry of Interior (MOI) is responsible to the CRS of Thailand.

Method used to evaluate the completeness of Thailand VRS

Both direct & indirect method had been used

1. Dual records procedure : completeness of births & deaths registration

- In the Survey of Population Change (SPC) 1964–1966, 1974–1976, and 1984–1986
- Manual matching between births/deaths reported in the SPC and those were recorded in the VRS
  - Multiple items used as matching keys such as f-name, l-name, sex, age, dob/dod, place of usual residence
- Chandrasekaran–Deming method was used to estimate total number of births and deaths

Both direct & indirect method had been used

2. Directly estimate from survey question :

completeness of birth & death registration

- In the SPC 1989, 1991, 1995–1996, and 2005–2006
  - Direct estimated from positive answers to a single question on whether birth/death events were reported to the registrars
- In MICS3 – MICS5 → completeness of birth registration

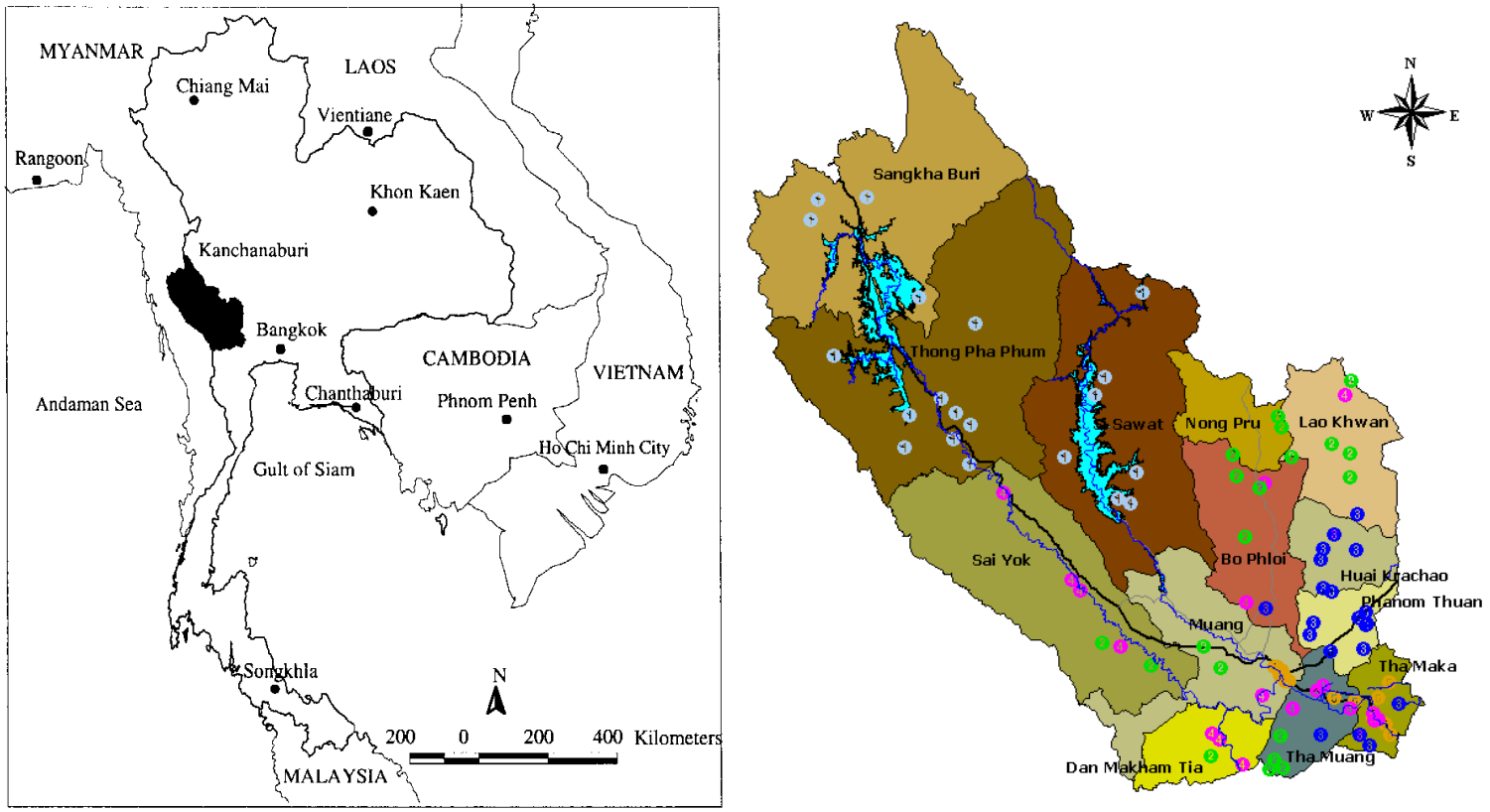
Both direct & indirect method had been used

3. Indirect demographic method : completeness of death registration

- In 1980, Preston & Hill method was applied to 1960 and 1970 Thailand census population and registered deaths during 1960 to 1970
- In 2007, GGB SEG and two-stage GGB-SEG were applied to 1980 1990 and 2000 Thailand census population

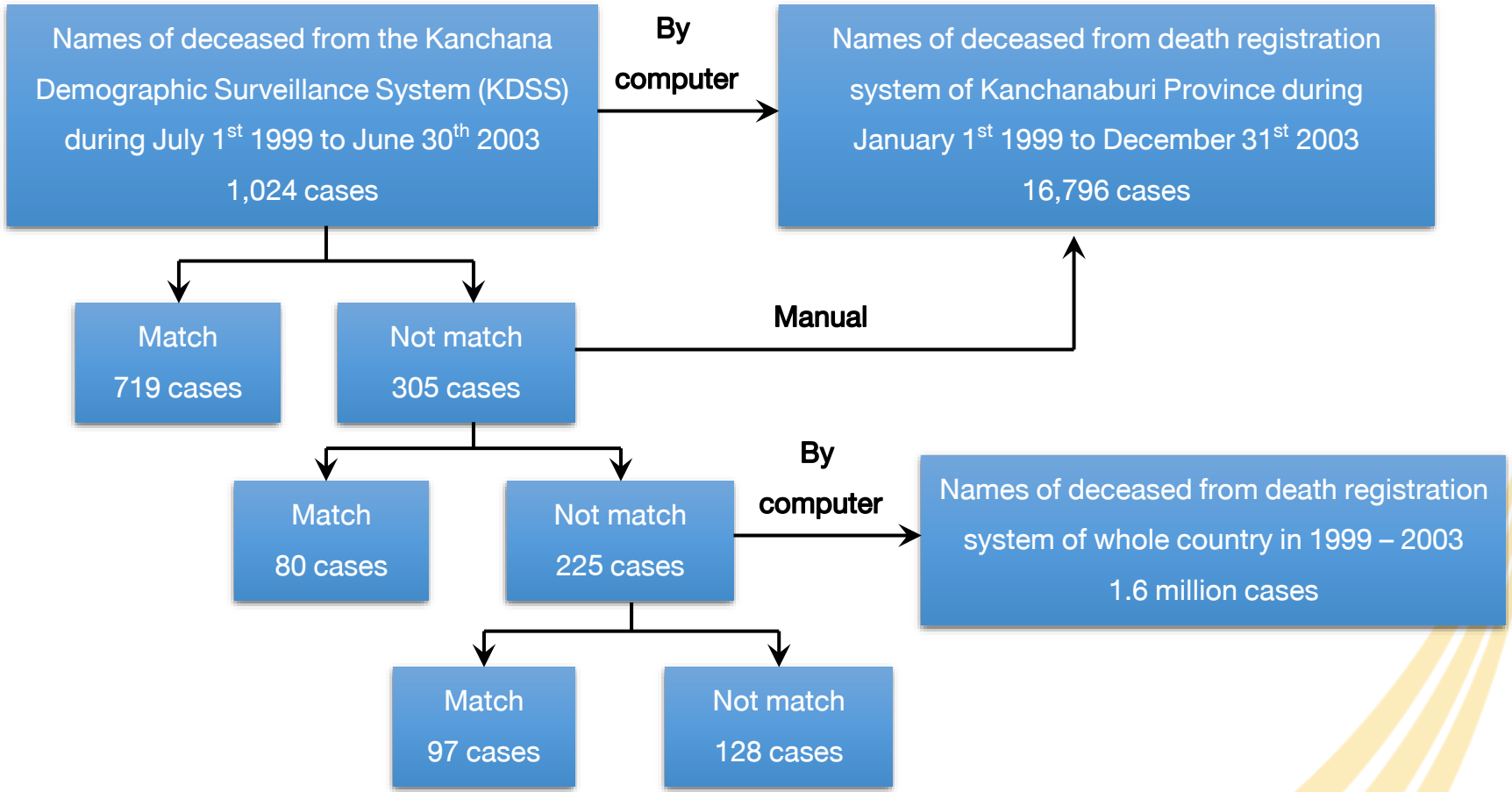
Experiences of applying dual records method to different settings

1. Applying dual records method to the Kanchanaburi Demographic Surveillance System (KDSS)



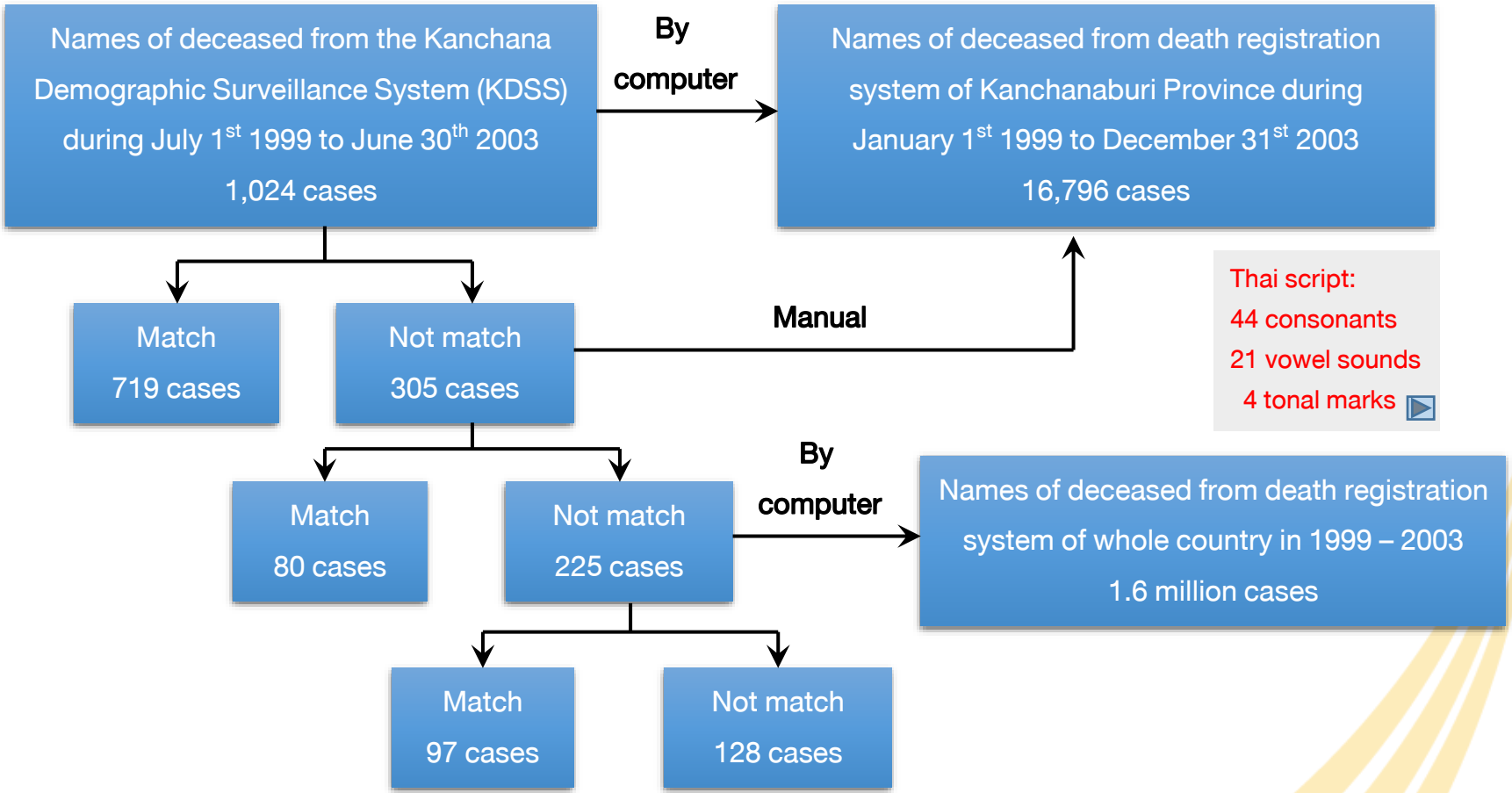
Map of Thailand showing Kanchanaburi province (left) and studied villages of Kanchanaburi Project (right)

1. Applying dual records method to the Kanchanaburi Demographic Surveillance System (KDSS)



Source: Prasartkul, P., & Vapattanawong, P. (2006). The completeness of death registration in Thailand: Evidence from demographic surveillance system of the Kanchanaburi Project. *World Health Population*, *8*. 43-51.

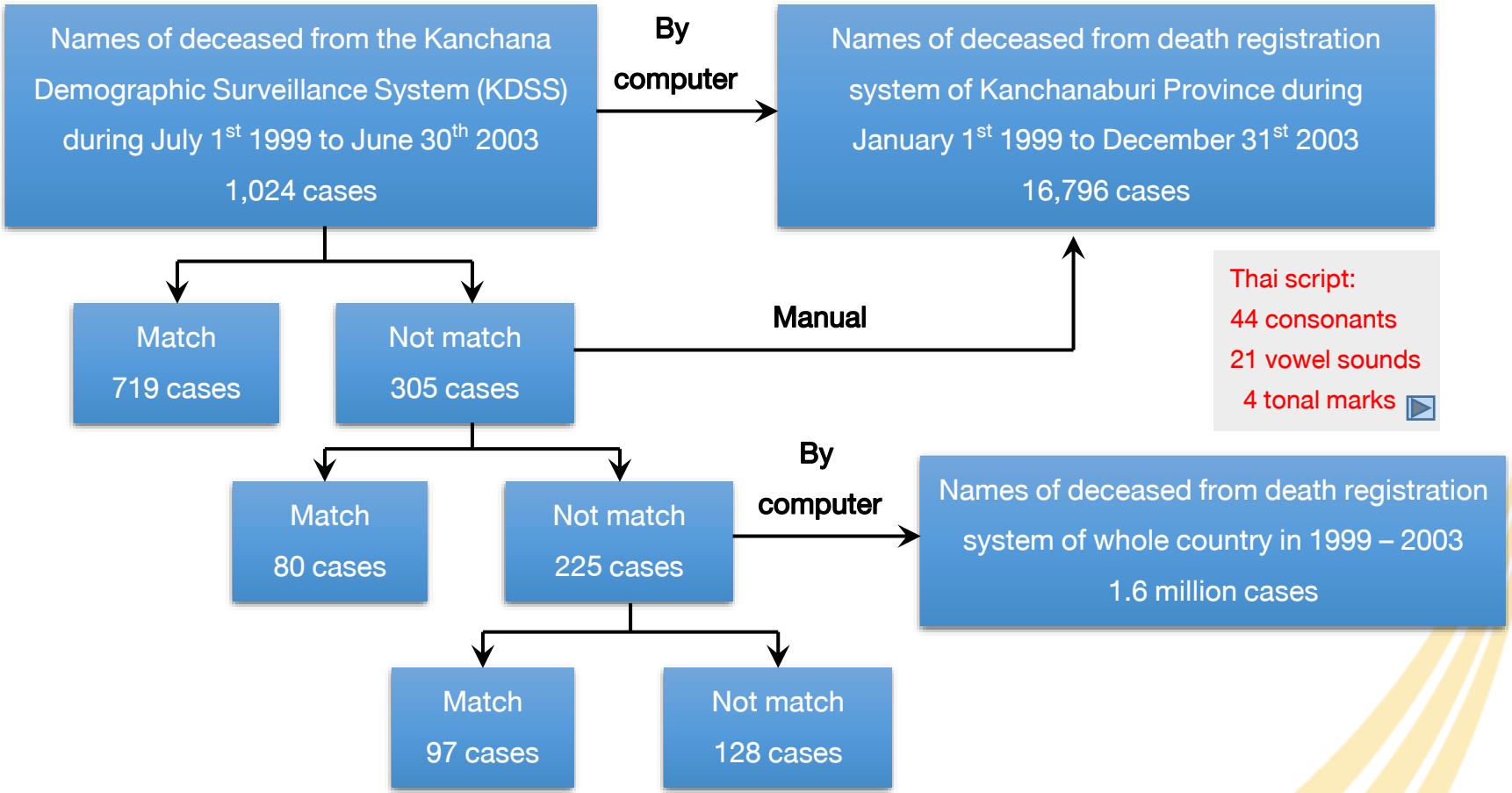
1. Applying dual records method to the Kanchanaburi Demographic Surveillance System (KDSS)



Source: Prasartkul, P., & Vapattanawong, P. (2006). The completeness of death registration in Thailand: Evidence from demographic surveillance system of the Kanchanaburi Project. *World Health Population*, *8*. 43-51.

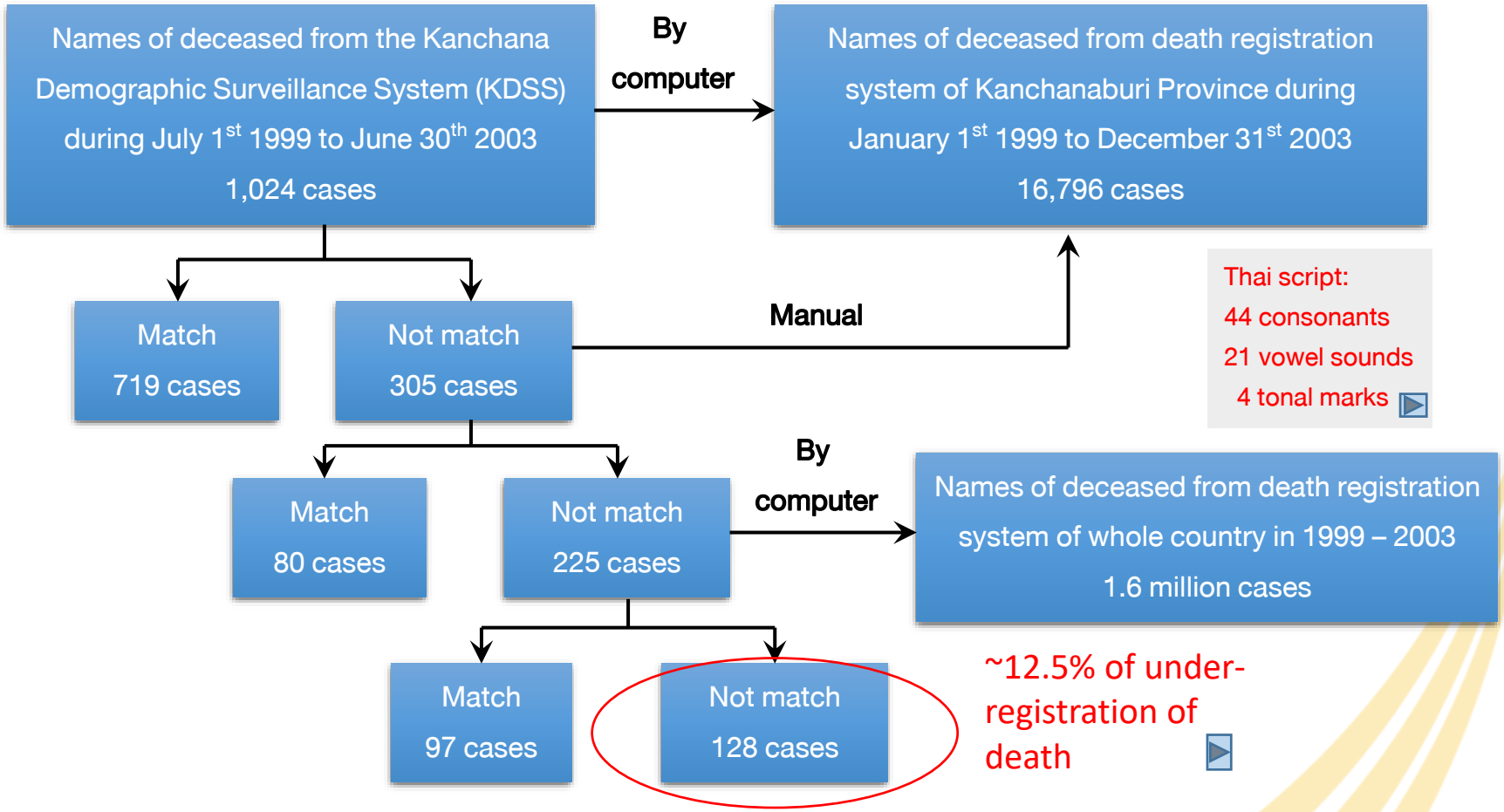
English	Thai	
Aree	อารี	อารีย์
Lamai	ละมัย	ละไม

1. Applying dual records method to the Kanchanaburi Demographic Surveillance System (KDSS)



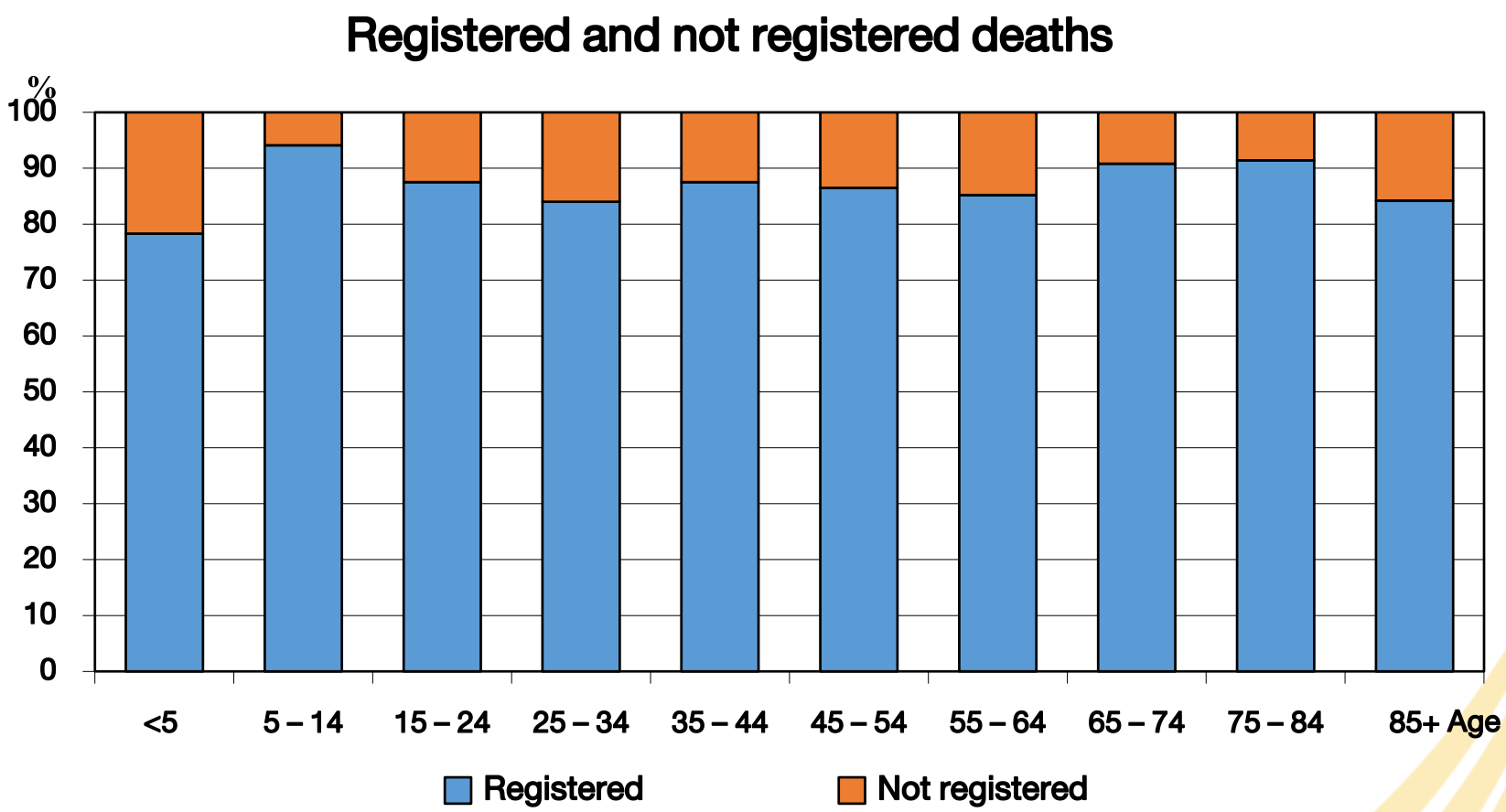
Source: Prasartkul, P., & Vapattanawong, P. (2006). The completeness of death registration in Thailand: Evidence from demographic surveillance system of the Kanchanaburi Project. *World Health Population*, *8*. 43-51.

1. Applying dual records method to the Kanchanaburi Demographic Surveillance System (KDSS)



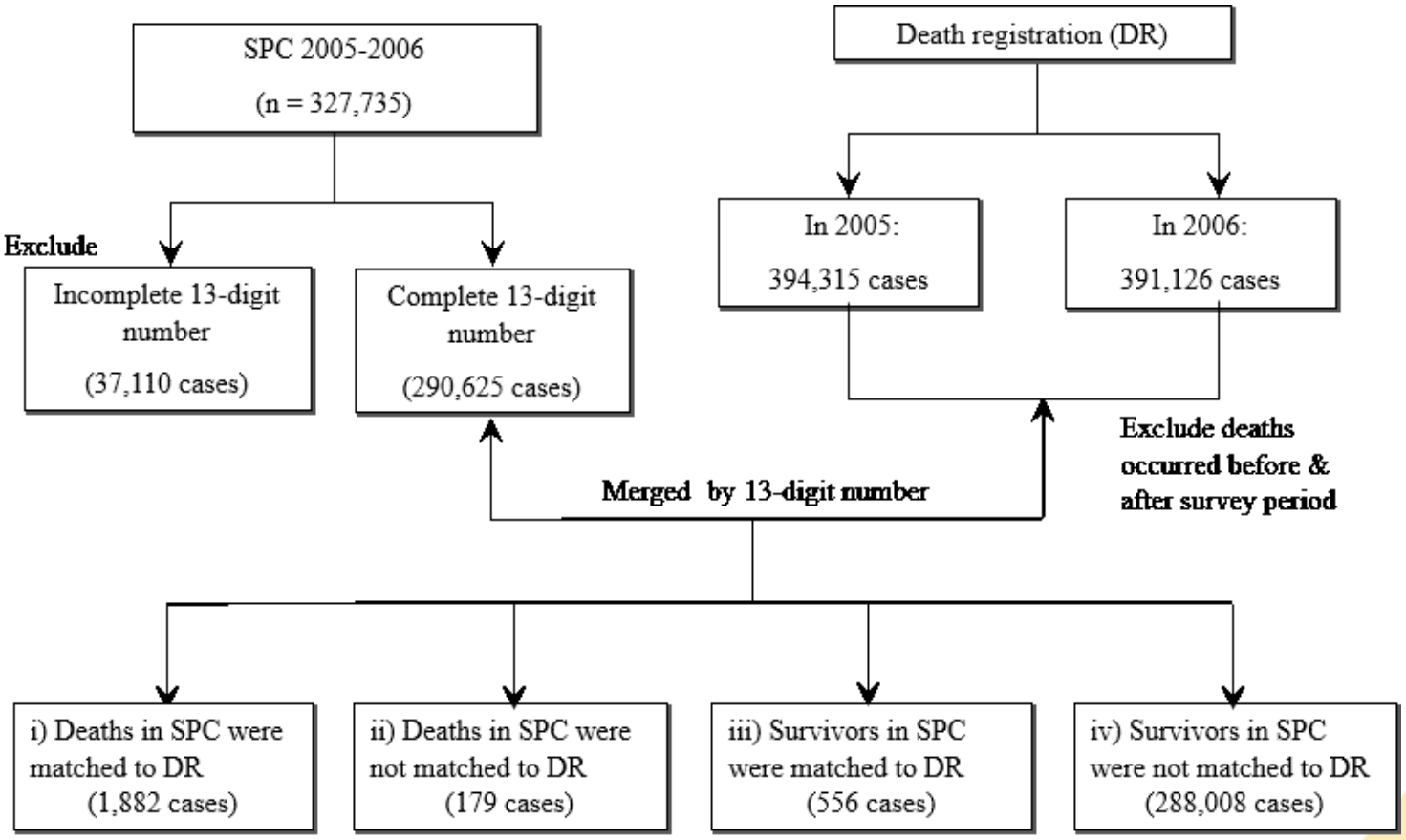
Source: Prasartkul, P., & Vapattanawong, P. (2006). The completeness of death registration in Thailand: Evidence from demographic surveillance system of the Kanchanaburi Project. *World Health Population*, *8*. 43-51.

1. Applying dual records method to the Kanchanaburi Demographic Surveillance System (KDSS)



Source: Prasartkul, P., & Vapattanawong, P. (2006). The completeness of death registration in Thailand: Evidence from demographic surveillance system of the Kanchanaburi Project. *World Health Population*, *8*. 43-51.

2. Applying dual records method to the reassessment of under-registration of deaths from the 2005-2006 SPC data



Source: Vapattanawong, P., & Prasartkul, P. (2011). Under-registration of deaths in Thailand in 2005-2006: results of cross-matching data from two sources. *Bulletin of the World Health Organization*, *89*. 806-812. doi:10.2471/BLT.10.083931

2. Applying dual records method to the reassessment of under-registration of deaths from the 2005-2006 SPC data

Status in SPC	Matching to death registration		Total
	No	Yes	
Alive	288,008	556	288,564
Dead	179	1,882	2,061
Total	288,187	2,438	290,625

~8.7% of under-registration of death

Source: Vapattanawong, P., & Prasartkul, P. (2011). Under-registration of deaths in Thailand in 2005-2006: results of cross-matching data from two sources. *Bulletin of the World Health Organization*, *89*. 806-812. doi:10.2471/BLT.10.083931

2. Applying dual records method to the reassessment of under-registration of deaths from the 2005-2006 SPC data

Age group (years)	Under-registration of deaths					
	Males		Females		Both sexes	
	%	95% CI	%	95% CI	%	95% CI
< 1	34.78	34.48-35.08	8.33	7.87-8.80	25.71	25.46-25.97
1–4	54.55	54.25-54.84	71.43	71.11-71.75	61.11	60.89-61.33
5–14	45.00	44.72-45.28	20.00	19.22-20.78	40.00	39.74-40.27
15–59	9.12	9.03-9.21	14.81	14.70-14.93	11.04	10.97-11.11
60–74	7.50	7.39-7.61	7.66	7.55-7.77	7.58	7.50-7.65
75+	5.56	5.47-5.64	6.08	6.016.15	5.86	5.81-5.91
Overall	9.00	8.95-9.05	8.36	8.31-8.41	8.69	8.65-8.72

Source: Vapattanawong, P., & Prasartkul, P. (2011). Under-registration of deaths in Thailand in 2005-2006: results of cross-matching data from two sources. *Bulletin of the World Health Organization*, *89*. 806-812. doi:10.2471/BLT.10.083931

3. Applying dual records method to the Universal Coverage Scheme (UCS) data (Not published yet)

- The Universal Coverage Scheme (UCS) is the biggest health insurance scheme in Thailand.
- It covers three-fourths of Thai citizens.
- The National Health Security Office (NHSO) is responsible for the UCS.
- The required standard datasets of inpatients under the UCS have to be sent from hospitals to the NHSO for reimbursement.
- So, the deaths records in the NHSO's UCS database can used to do matching with death registration using ***encrypted 13-digit number as a matching key***.

3. Applying dual records method to the Universal Coverage Scheme (UCS) data (Not published yet)

Country/ Region	Deaths recorded in UCS database						Deaths recorded in VR system*				
	2008	2009	2010	2011	2012		2008	2009	2010	2011	2012
Country	27,379	96,301	104,002	106,795	111,037		192,349	189,078	204,569	205,893	212,569
Region											
Bangkok	2,739	8,038	8,480	8,348	8,724		10,502	10,857	11,557	11,790	12,301
Central	9,200	3,2673	35,675	36,951	38,553		47,026	46,236	49,952	50,231	52,167
North	6,010	21,403	23,627	23,618	24,215		46,260	45,225	49,537	48,705	50,010
Northeast	6,336	23,253	24,741	25,901	26,646		67,486	65,541	70,913	72,343	74,136
South	3,093	10,929	11,475	11,948	12,810		21,075	21,219	22,610	22,824	23,955

* Only those who were under UCS

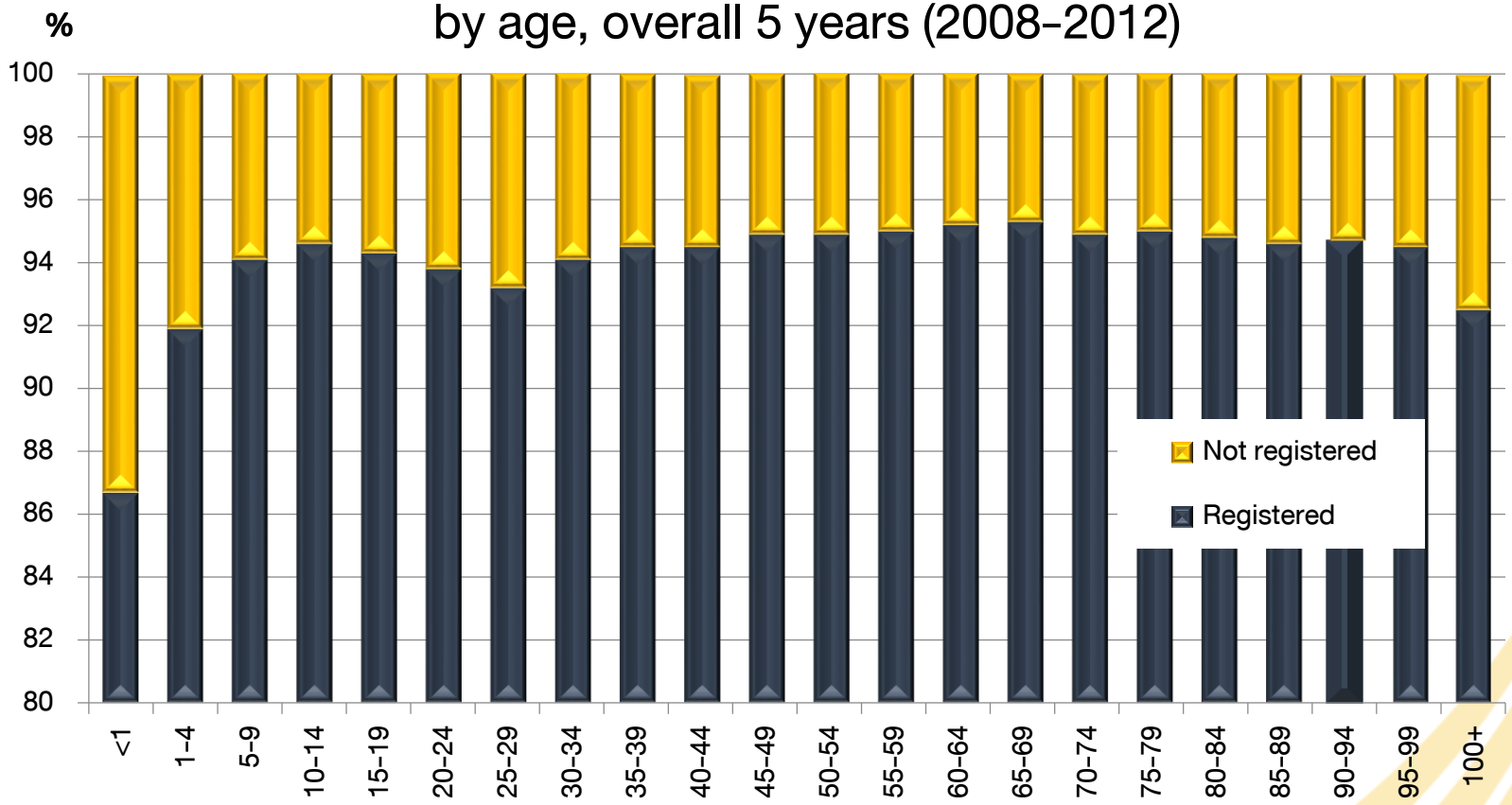
3. Applying dual records method to the Universal Coverage Scheme (UCS) data (Not published yet)

Percent completeness of registration of death from the UCS database by sex and year

Sex	% Completeness of registration of death from the UCS database					
	2008	2009	2010	2011	2013	2008-2012
Male	89.8	93.2	95.6	94.3	95.7	**94.4**
Female	89.6	93.6	96.2	94.4	95.7	**94.7**
Both sexes	89.7	93.3	95.9	94.3	95.7	**94.5**

3. Applying dual records method to the Universal Coverage Scheme (UCS) data (Not published yet)

Percent completeness of registration of death from the UCS database by age, overall 5 years (2008–2012)



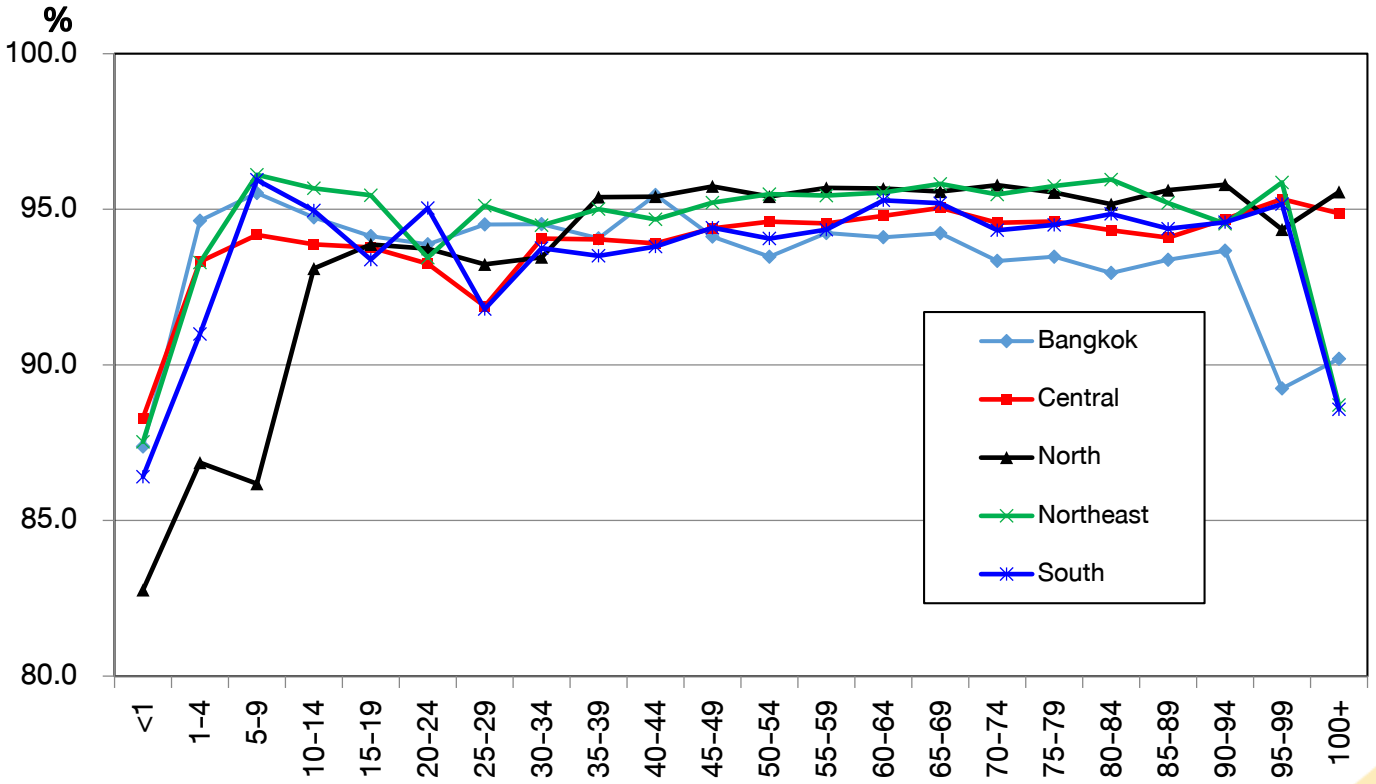
3. Applying dual records method to the Universal Coverage Scheme (UCS) data (Not published yet)

Percent completeness of registration of death from the UCS database by region and year

Regio	% Completeness of registration of death from the UCS database					
	2008	2009	2010	2011	2013	2008-2012
Bangkok	85.8	93.4	95.2	93.7	94.8	93.7
Central	88.8	93.3	95.5	93.9	95.6	**94.3**
North	90.7	93.5	96.5	95.0	96.2	**95.1**
Northeast	92.2	93.6	96.3	94.8	96.0	**95.0**
South	88.8	92.8	95.2	93.8	94.9	93.9
Total	**89.7**	**93.3**	**95.9**	**94.3**	**95.7**	**94.5**

3. Applying dual records method to the Universal Coverage Scheme (UCS) data (Not published yet)

Percent completeness of registration of death from the UCS database by age and region, overall 5 years (2008–2012)



3. Applying dual records method to the Universal Coverage Scheme (UCS) data (Not published yet)

- The results found in this study reflex ***the completeness of the UCS inpatient death registration only***.
- Except in 2008, %completeness is ~95%.
- Patterns of completeness are similar to previous studies.

Lessons learned from those experiences

Lesson learned from recent experiences with the application of dual records method

Several factors affecting to these studies:

- Close collaborative among responsible organizations
- Highly cooperative between responsible organizations and researchers
- Knowledge and skills of responsible officers (operators)
- Different settings, different means to perform cross-matching
- Still practical but requiring some proper adjustments
- Parallel studying if data available

Recommendations

- The dual records system is still useful, especially in countries where several sources of vital data existed like Thailand. We should not overlook it. The cross-matching between two or more than two sources if data available is recommended.
- For Thailand, the research on the evaluation of completeness of vital registration at sub-national such as provincial level should be taken for consideration.
  - Since the MOPH has developed the system of family folder to collect and record individual health and health services at household level. This source of data is proper to do cross-matching if it is regularly updated.

THANK YOU