

# **Report on Field Trial of APN ICD-10 Simplified Version**

Field Trial Test in Cambodia,  
February – May 2016

# Why simplified version?



WHO-FIC  
Asia Pacific  
Network

ICD-10 Simplified  
Version 2016

This is a copy of the APNICD-10 Simplified  
Version 2016  
released by the WHO-FIC Asia Pacific Network  
in February 2016 (β-3 version)

- Make ICD coding easier than original version

# Coding time comparison

Steps	Traditional way coding time	Simplified way coding time
1. Keyword select	3 minutes	3 minutes
2. ICD select	3 minutes	30 seconds
3. ICD verify	2 minutes	-
4. Add 4 <sup>th</sup> digit	1 minutes	-
5. Assign code	30 seconds	30 seconds
Total time	9 min 30 sec	4 minutes

# APN ICD-10 Simplified Version

- **Is** a simplified ICD-10 alphabetical index. (vol. 3)
- **Not** a selected list of the ICD-10 tabular list. (vol.1)
- So ICD-10 codes were not reduced in the APN version
- Anyone can use the APN ICD-10 Simplified version together with ICD-10 tabular list for clinical coding without any difficulty.

# Introduction of APN Simplified version in Cambodia

- Why Cambodia?
  - Join APN meeting since 2007 in Kyoto.
  - Show interests to try and test the APN Simplified version since 2014
- Cambodia current situation
  - Start ICD-10 usages in hospital morbidity statistics since 2012
  - Some hospital use PMRS list of ICD-10 codes to do ICD coding

# ICD-10 list in PMRS system

## IPD Pre-Defined Discharged Diagnoses

Discharged Diagnoses		ICD10
<b>1. General medicine</b>		
1	Cholera	A00
2	Unspecified Cholera	A00.9
3	Typhoid Fever	A01
4	Amoebiasis	A06
5	Diarrhea without dehydration	A09
6	Diarrhea with moderate dehydration	A09.1
7	Diarrhea with severe dehydration	A09.2

Inappropriate Grouping

Incorrect Codes

Incorrect Codes

<b>7. Maternity</b>		
136	Ectopic Pregnancy	O00
137	Hydatidiform mole	O01
138	Early fetal death (pregnancy < 26 weeks)	O02.1
139	Gestational oedema	O12.0
140	Gestational Hypertension	O13
141	Mild to moderate pre-eclampsia	O14.0
142	Severe pre-eclampsia	O14.1
143	Eclampsia	O15
144	Hemorrhage during pregnancy (< 20 weeks)	O20
145	Excessive vomiting during pregnancy	O21
146	Placental disorders	O43
147	Placenta accreta	O43.21
148	Placenta percreta	O43.23

Incorrect Codes

# ICD-10 list in PMRS system

4. Non-communication diseases		
72	Diabetes 1	E10
73	Diabetes 2	E11
74	Severe acute malnutrition (SAM) with nutritional oedema	E40
75	SAM with clinical signs	E41
76	SAM - weight for height Z score < -3 Standard Deviation (SD)	E43
77	Mild acute malnutrition - weight for height Z score -1 to -2 SD	E44.0
78	Moderate acute malnutrition - weight for height Z score -2 to -3 SD	E44.1
79	Harmful use of addicted substances	F11.1
80	Secondary hypertension	I10.0
81	Primary hypertension	I10.9
82	Sequelae of cerebrovascular disease	I69
83	Pregnant women with hypertension	O24.4

Inappropriate Grouping

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Incorrect Codes

# APN Activity for ICD-10 Implementation in Cambodia

- April 2015 APN + Future Group (USAID) arrange ICD-10 implementation workshop for MOH Cambodia
  - ICD-10 for morbidity and mortality statistics
  - Resources for ICD-10 implementation e.g. ICD coders recruitment, ICD10 books, coding job assignment and incentives
  - Introduction of the beta-2 version of APN ICD-10 Simplified version for Primary Care

# APN Activity for ICD-10 Implementation in Cambodia

- October 2015 after some discussion with Dr.Kiry and WHO regional advisor (Jun Gao)
  - It was unlikely to use full ICD-10 version in the near future
  - MOH would like to try using APN ICD-10 simplified version for **hospital coding**.
  - APN Manchester meeting, Jun Gao informed that primary care version might not be a first priority, some countries for example Laos need simplified version for hospital coding.
  - APN agree to update APN ICD-10 simplified version for use in hospital (beta-3 version)

# APN Activity for ICD-10 Implementation in Cambodia

- February 2016 APN and the Palladium(Future) Group arrange to workshop for MOH
  - ICD coding with APN Simplified Version beta-3
  - 10 hospitals will test coding with APN tool for 100 cases and report any problems or difficulties within March 18.
  - Field Trial Results will be report in the next APN meeting in June 2016.

# Field Trial Plan

- *Objectives*

1. To study the feasibility of using the APN ICD-10 Simplified beta-3 Version in selected Cambodia Hospitals.
2. To identify factors which should be strengthened or prepared for successful implementation of ICD-10 in Cambodia health information system
3. To identify any demands for future development of the APN ICD-10 Simplified version

# Trial Processes

1. Selection of ten target hospitals.
2. Each hospital/health centers find 100 cases with different disease/cases i.e.
  1. Infections 15 cases
  2. Injuries 15 cases
  3. Tumor or cancer 10 cases
  4. Pregnancy cases 10 cases
  5. Postpartum cases 5 cases
  6. Perinatal cases 5 cases
  7. Other diagnosis 40 cases
3. Each clinical coder or doctor complete the important information from each patient using the test from A1 (see Appendix) then assign ICD-10 codes selected from APN ICD-10 Simplified version book to each case with comment (if any).
4. Send the forms to the trial center in electronic files.



# Field Trial Plan -2

*Target Health Care Facilities*                      10 Hospitals  
*Testers* 1-2 Doctors and/or Potential Clinical Coders from each facility

*Number of Cases*                      1,000 cases (100 cases from each facility)

*Project Duration*                      6 weeks

## *Activities*

First week (1-5 February 2016)

2 days orientation courses for doctors or ICD coders

2<sup>nd</sup> – 6<sup>rd</sup> weeks (8 February – 18 March 2016)

Cases coding using APN ICD-10 Simplified version beta-3

7<sup>th</sup> week (21-25 March 2016)

Report summarization

# Result : List of 10 Hospitals

No.	Name of Provincial Hospital	Name of Participant	Title
1	Banteay Meanchey	Lay Vannarath	Physician
		NeangSopheng	Admin. Vice-chief
2	Battambang	Oum Nhel	Deputy Director
		Tin Saravuth	Admin. Officer
3	Pursat	Kong Chanrady	Physician
		PrumSarom	HIS Officer
4	16 Makara (Preah Vihear)	Chou Ponina	Deputy Director
		Meas Rathanak	IT Officer
5	Kampong Chhnang	MeasDutty	Chief of TO
		Ly Sarath	HIS Officer
6	Kampong Thom	Chan Sakhan	HIS Officer
		KeoChanny	Physician
7	Prey Veng	Ung Chanthean	Director
		Sok Kalyan	HIS Officer
8	Takeo	Mel Pognealey	Physician
		Chea Huot	HIS Officer
9	Svay Rieng	An Sophy	Deputy Director
		Riem Sina	HIS Officer
10	Kampong Cham	Mey Moniborin	Deputy Director
		Kheang Bunsim	HIS Officer

# Results

- **Three** hospitals staff (Takeo, Svay Rieng and Kampong Cham) **never use** the local PMRS list to do ICD-10 coding. But other seven hospital staff had some experiences of using the PMRS list to do ICD-10 coding before.
- **Seven** hospitals could **complete the field trial work within agreed deadline** (6 weeks), but three hospitals (Pursat, 16 Makara, Prey Veng) could not finish the work and extended to continue work until 16<sup>th</sup> week.
- However, the field trial manager waited for their results to include all planned cases into the result analysis.

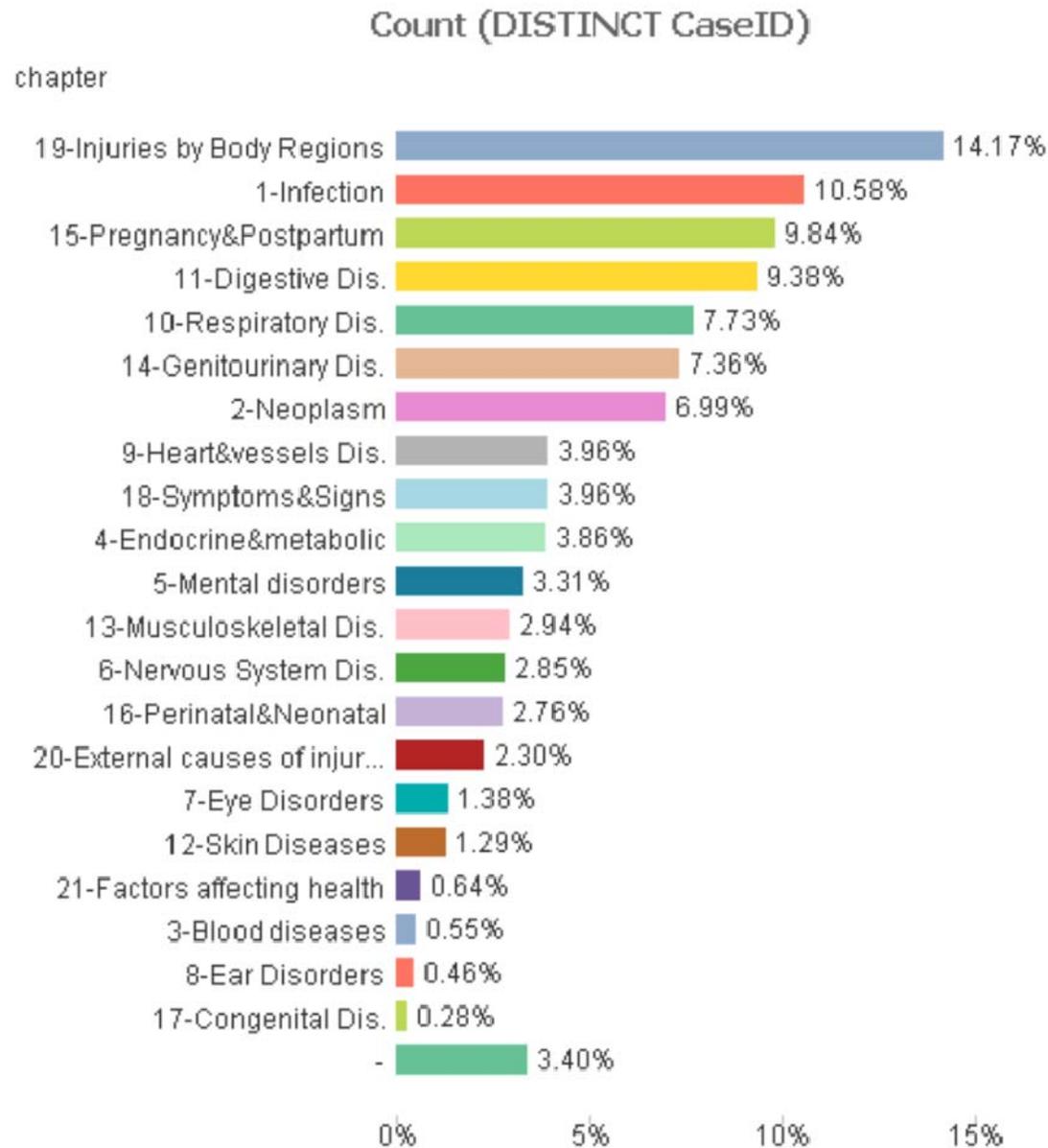
# Results : Number of field trial cases and ICD-10 codes from each hospital.

Hospital	No. Cases	No. ICD Codes
<b>Total</b>	<b>1038</b>	<b>1099</b>
1Bantay	106	107
2Battambang	97	100
3Pursat	100	100
4Preyvihear	91	91
5Kampongchanang	117	118
6Kampongtom	117	117
7Preyveng	130	130
8Takeo	111	128
9Svayreang	85	108
10Kampongcham	84	100

# Table-3 Number of field trial cases group by ICD-10 Chapter.

ICD Chapter	No. Cases	Frequency
<b>Total</b>	<b>1038</b>	<b>100.00%</b>
1-Infection	115	10.58%
2-Neoplasm	76	6.99%
3-Blood diseases	6	0.55%
4-Endocrine&metabolic	42	3.86%
5-Mental disorders	36	3.31%
6-Nervous System Dis.	31	2.85%
7-Eye Disorders	15	1.38%
8-Ear Disorders	5	0.46%
9-Heart&vessels Dis.	43	3.96%
10-Respiratory Dis.	84	7.73%
11-Digestive Dis.	102	9.38%
12-Skin Diseases	14	1.29%
13-Musculoskeletal Dis.	32	2.94%
14-Genitourinary Dis.	80	7.36%
15-Pregnancy&Postpartum	107	9.84%
16-Perinatal&Neonatal	30	2.76%
17-Congenital Dis.	3	0.28%
18-Symptoms&Signs	43	3.96%
19-Injuries by Body Regions	154	14.17%
20-External causes of injuries	25	2.30%
21-Factors affecting health	7	0.64%
Unknown	37	3.40%

# Top-20 Cases group by ICD Chapters



# Table-4 use of ICD code labels instead of diagnosis terms from one hospital.

<b>Case No.</b>	<b>HN</b>	<b>Sex</b>	<b>Age</b>	<b>Age Unit</b>	<b>Diagnosis Terms</b>
1	001-069-106-2	Male	17	Years	Cholera, unspecified
2	001-069-145-0	Female	14	Years	Cholera, unspecified
3	001-069-387-1	Female	15	Years	Cholera, unspecified
4	001-071-744-2	Female	63	Years	Cholera, unspecified
5	001-069-993-9	Male	3	Months	Cholera, unspecified
6	001-069-408-0	Female	10	Years	Amebiasis
7	001-069-083-2	Male	31	Years	Typhoid and paratyphoid fevers
8	001-072-323-2	Male	39	Years	Typhoid and paratyphoid fevers
9	001-074-723-0	Female	31	Years	Typhoid and paratyphoid fevers

# ICD Coding Accuracy

Hospital	Accuracy
<b>average</b>	<b>80.71%</b>
4Preyvihear	93.41%
1Bantay	89.72%
6Kampongton	88.03%
10Kampongcham	87.00%
8Takeo	82.03%
7Preyveng	79.23%
5Kampongchanang	78.81%
3Pursat	72.00%
2Battambang	71.00%
9Svayreang	66.67%

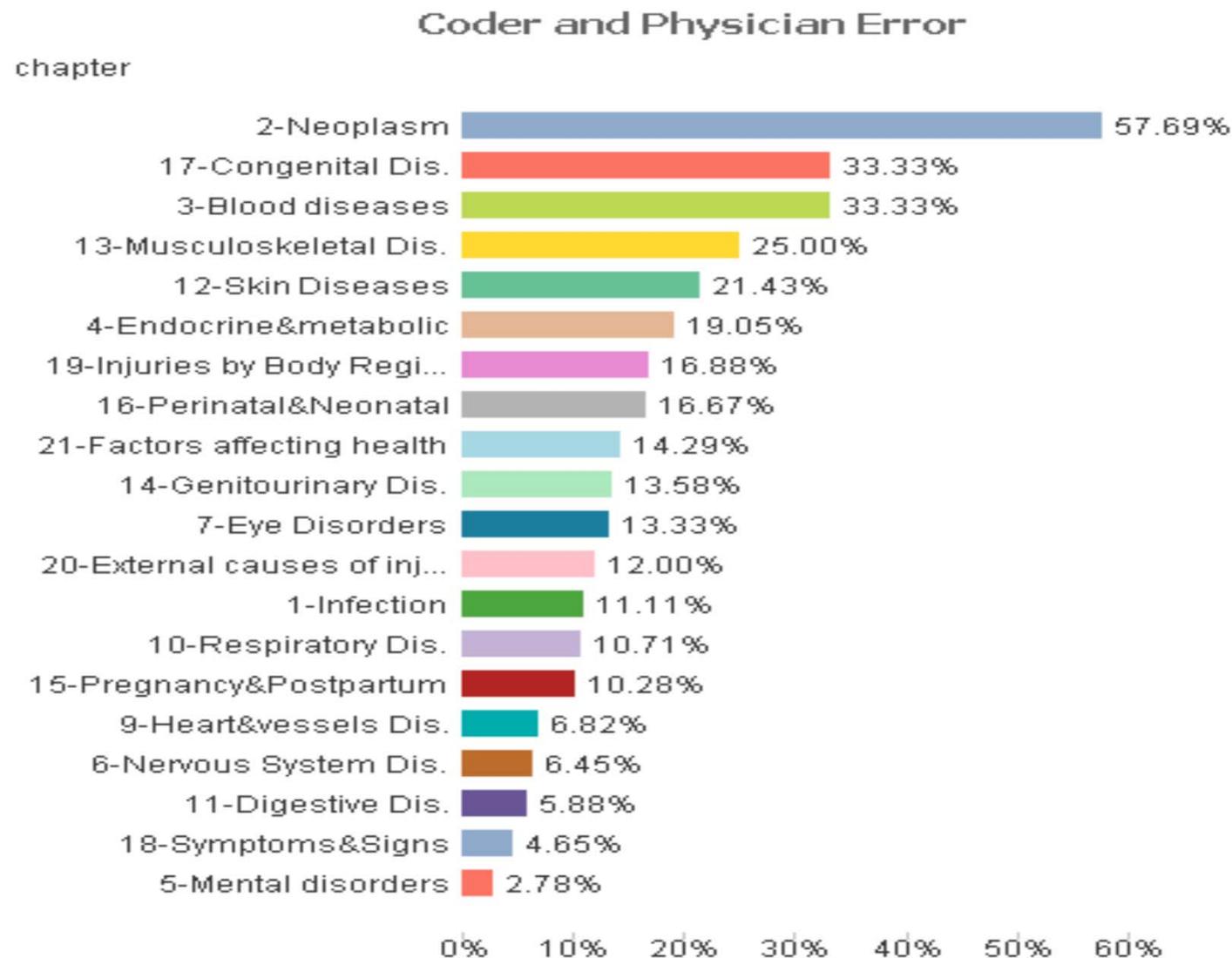
# *ICD Coding Errors*

- **Coder Error** –is incorrect chosen of ICD codes by the clinical coders which may was caused by misunderstanding, misreading or mistyping of ICD codes into the report.
- **Physician Error** –is inappropriate record of diagnosis terms by doctor so the clinical coders could not find the suitable ICD code for the patient.
- **System Error** –is missing of diagnosis terms from the APN ICD-10 Simplified version so the clinical coders could not find the suitable ICD code for the patient.

# ICD Coding Errors

Hospital	Coder Error	Physician Error	System Error	Total Error
<b>Total</b>	<b>14.56%</b>	<b>1.27%</b>	<b>3.46%</b>	<b>19.29%</b>
9Svayreang	30.56%	0.93%	1.85%	33.33%
2Battambang	25.00%	0.00%	4.00%	29.00%
3Pursat	20.00%	2.00%	6.00%	28.00%
7Preyveng	17.69%	0.00%	3.08%	20.77%
8Takeo	13.28%	0.00%	4.69%	17.97%
5Kampongchanang	12.71%	3.39%	5.08%	21.19%
10Kampongcham	9.00%	0.00%	4.00%	13.00%
6Kampongthom	7.69%	1.71%	2.56%	11.97%
1Bantay	5.61%	1.87%	2.80%	10.28%
4Preyvihear	3.30%	3.30%	0.00%	6.59%

# Coder and physician errors for all patients group by ICD chapter



# 14 cases with physician errors.

RecordID	Sex	Age	AgeUnit	DiagnosisTerms
586	2	18	years	Other inflammation of vagina and vulva
732	1	21	Years	Shooting Accidental
605	2	21	Years	Traumatic crannies
585	2	25	years	Other inflammation of vagina and vulva
731	2	26	Years	Bitten by centipede
1087	1	28	Years	Burn 40% over the body
826	1	28	Years	Burn by Hot Cooker
613	2	32	Years	Fracture of lumbar spine and pelvis
566	1	41	Years	Unknow Medicines
729	2	45	Years	Bitten by dog
1061	1	50	Years	Right leg trauma
564	2	58	Years	Thoracix oppression
146	2	71	Years	Occlusion
834	2	90	Years	Trauma/ FallDown

# Example of system errors.

<b>RecordID</b>	<b>Sex</b>	<b>Age</b>	<b>AgeUnit</b>	<b>DiagnosisTerms</b>
10	2	26	Years	vaginal hematoma post partum
507	2	28	Days	Beri Beri Cardiac
829	1	28	Years	Skull base Fracture
837	1	28	Years	Chest Trauma/ac
269	1	32	Years	Intracranial injury
366	2	34	Years	Hemorrhagic Strokes (Bleeds)

# Discussion

- Successful implementation of ICD-10 depends on two groups of staff in hospital i.e. physician and clinical coders.
- Physicians play important role on writing good diagnosis statement in the medical record
- while clinical coders assign ICD-10 codes based on diagnosis terms and patient context.

# Discussion

- All ten hospitals in this field trial showed competency on recording diagnosis statement for each patient as well as assignment of ICD-10 codes based on each patient context.
- One hospital incorrectly use ICD-10 code labels instead of real diagnosis term but could change the error after requested by trial center.

# Discussion

- APN ICD-10 Simplified version could be used effectively to assign ICD-10 codes for 96.45% of trial cases with 80.71% accuracy rate.
- The most common ICD coding errors was coder errors (14.56%).
- The accuracy rate will be higher if the clinical coders are well trained and strictly do ICD coding using standard coding guideline and practices.

# Discussion

- Field trial results showed some issues that could be used to improve APN ICD-10 Simplified beta-3 version,
- for example at least 38 diagnosis terms should be added and some typing errors should be corrected.

# Discussion

- To ensure high accuracy of ICD-10 coding, physician must be trained on the technics of “How to write good diagnosis terms.”
- Because if the physician write diagnosis terms using ambiguous or vague terms, the clinical coders will not be able to do ICD-coding correctly.

# Conclusion

- The field trial results demonstrate the feasibility that the APN ICD-10 Simplified version could be used as an effective tool to do ICD-10 coding for hospitals in Cambodia.
- The simplified version could reduce coding time and efforts with acceptable accuracy.

# Conclusion

- Developing countries should consider adapting the APN ICD-10 Simplified version for ICD-10 codes assignment in hospitals and health care centers.
- So producing morbidity statistics in the countries could be achieved easily.