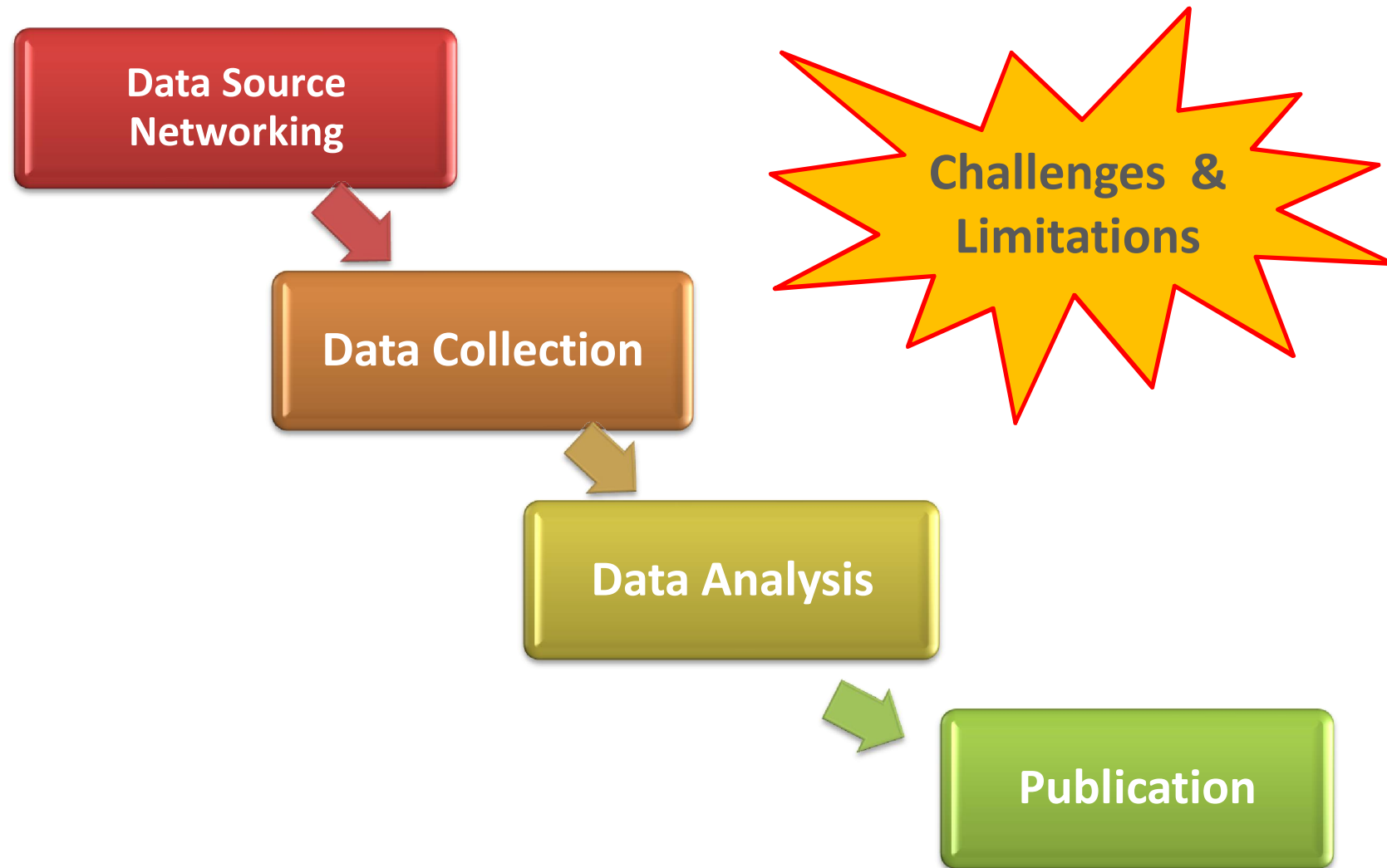


NHA ESTIMATION : MOH, OOP & CORPORATION

*Dr Noryati Binti Yusof @ Atan
14th March 2017,
MNHA Seminar 2017
Hotel Bangi-Putrajaya*

MNHA Methodology



Agencies

☐ Ministry of Health (MOH)

☐ Out-of-Pocket (OOP)

☐ All Corporation (Corps)

MINISTRY OF HEALTH (MOH)

AG Data used in NHA

Accountant General (AG) in form of “*electronic data*”(raw data)

❑ Expenditure Data :-

- Operational (B42)
- Development (P42)

MOH Estimation

❑ Revenue Data:-

- User charges

OOP Estimation

Various format of AG Data

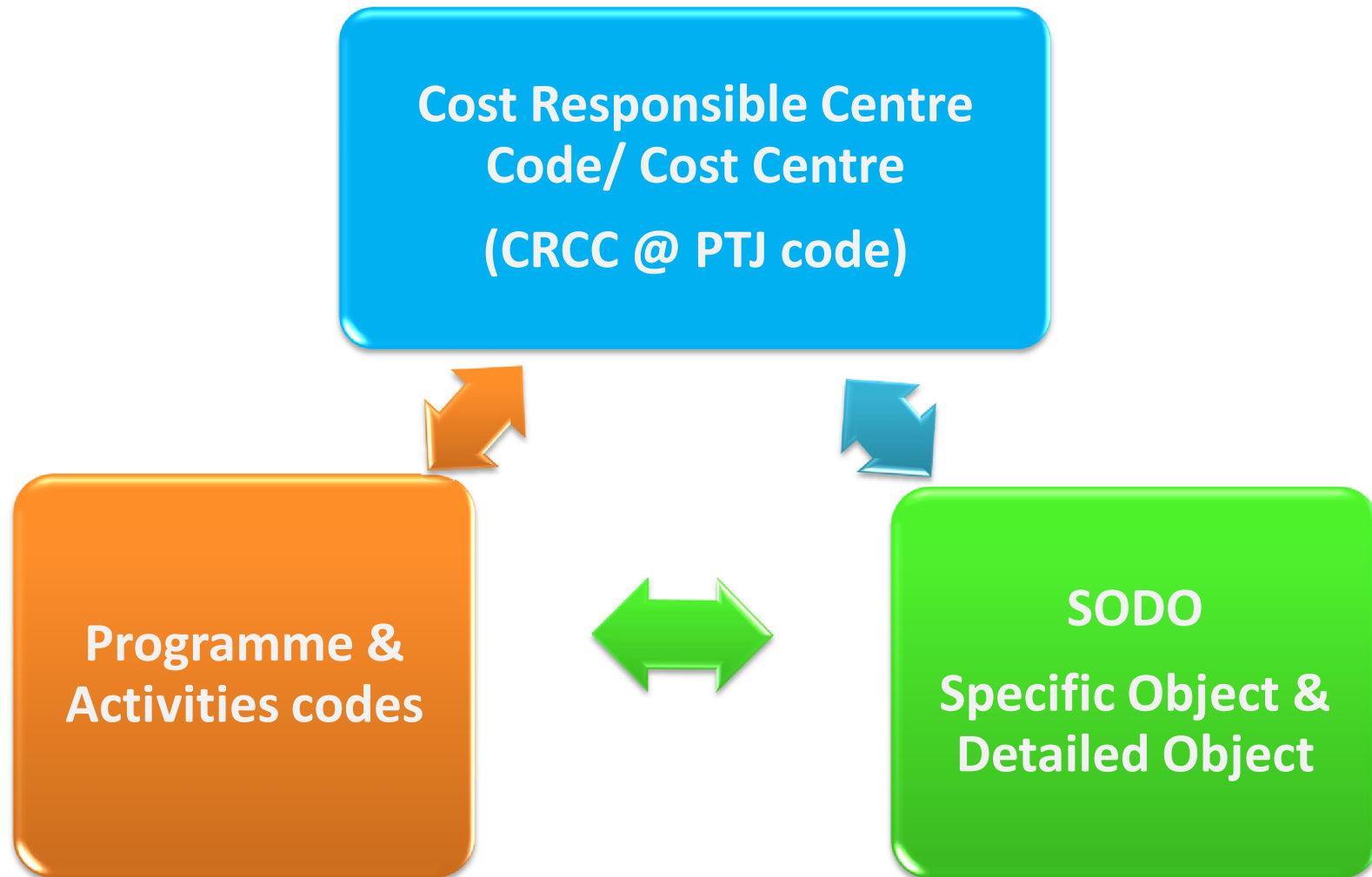
MOH Health Expenditure raw data for every year

➤ 1997-2006
- in .txt form

➤ 2007-2015
- in excel

Laporan Generic Perbelanjaan MOH					
Structure	K od Jab = 251				
Vot	PTJ Header = 010103				
Kod PTJ (Header)					
Kod PTJ/PK					
Program/Aktiviti					
Objek					
Chart of accounts	FGCA				
Posting period	<= 16				
Fiscal Year Variant	Calendar year, 4 spec. periods				
Fiscal year	K4/2007				
FM area	FGOM				
Vot	KEMENTERIAN KESIHATAN				
Objek	10000..12999				
Vot	Kod PTJ (Header)	Kod PTJ/PKDE	Program/Aktiviti	Objek	Jumlah Perbelanjaan RM
B42	251010103	FGOM/251010101	B42010100	11101	401,840.01
				11201	29,818.86
				11301	198,851.40
				11601	159.72
				12101	22,587.50
				12102	33,525.00
				12103	10,950.00
				12107	13,500.00
				12199	51,800.00
				12201	2,175.00

Codes in Accounting System



CRCC @ PTJ code - Example

PUSAT TANGGUNGJAWAB : JKN PERAK				
PERIHAL PUSAT TANGGUNGJAWAB/PUSAT KOS	KOD PTJ1	KOD PTJ 2	KOD PTJ3	KOD PUSAT KOS
Jabatan Kesihatan Negeri Perak	050000			
Hospital Ipoh		050100		
Unit Pentadbiran/ Kewangan / Pengurusan				050101
Unit Rekod Perubatan				050102
Perpustakaan				050103
Unit Teknologi Maklumat				050104
Pej. Timb. Pengarah Kesihatan Negeri Perak (Pergigian)		050200		
Unit Pentadbiran Am				050201
Pejabat Kesihatan Pergigian Daerah Hilir Perak			050251	
Pejabat Kesihatan Pergigian Daerah Larut Matang dan Selama			050252	
Pejabat Kesihatan Pergigian Daerah Manjung			050253	
Pejabat Kesihatan Pergigian Daerah Kinta			050254	
Pejabat Kesihatan Pergigian Daerah Kuala Kangsar			050256	
Pejabat Kesihatan Pergigian Daerah Batang Padang			050257	
Pejabat Kesihatan Pergigian Daerah Kerian			050258	
Pejabat Kesihatan Pergigian Daerah Perak Tengah			050259	
Pejabat Kesihatan Pergigian Daerah Hulu Perak			050260	
Pej. Timb. Pengarah Kesihatan Neg. Perak (Farmasi)		050300		
Unit Pentadbiran Am				050301
Hospital Teluk Intan		050400		
Unit Pentadbiran/ Kewangan / Pengurusan				050401

CRC Codes

SODO Code - Example

10000 EMOLUMEN

- 11000 - Gaji dan Upahan
- 12000 - Elaun Tetap
- 13000 - Sumbangan Berkanun Untuk Kakitangan
- 14000 - Elaun Lebih Masa
- 15000 - Faedah-Faedah Kewangan Yang Lain
- 16000 - Bayaran Elaun-Elaun Khas
- 17000 - Bayaran Imbuhan Tahunan dan Bantuan Kewangan

20000 PERKHIDMATAN DAN BEKALAN

- 21000 - Perbelanjaan Perjalanan Dan Sara Hidup
- 22000 - Pengangkutan Barang-Barang
- 23000 - Perhubungan dan Utiliti
- 24000 - Sewaan
- 25000 - Bahan-Bahan Makanan Dan Minuman
- 26000 - Bekalan Bahan Mentah Dan Bahan-Bahan Untuk Penyelenggaraan Dan Pembaikan
- 27000 - Bekalan Dan Bahan-Bahan Lain
- 28000 - Penyelenggaraan Dan Pembaikan Yang Kecil Yang Dibeli
- 29000 - Perkhidmatan Iktisas Dan Perkhidmatan Lain Yang Dibeli Dan Hospitaliti

30000 ASET

- 31000 - Tanah Dan Pembaikan Tanah
- 32000 - Bangunan Dan Pembaikan Bangunan

Programme & Activities codes - Example

SENARAI KOD PROGRAM / AKTIVITI / SUB AKTIVITI BAGI TAHUN 2017

KEMENTERIAN KESIHATAN MALAYSIA

Activity Code

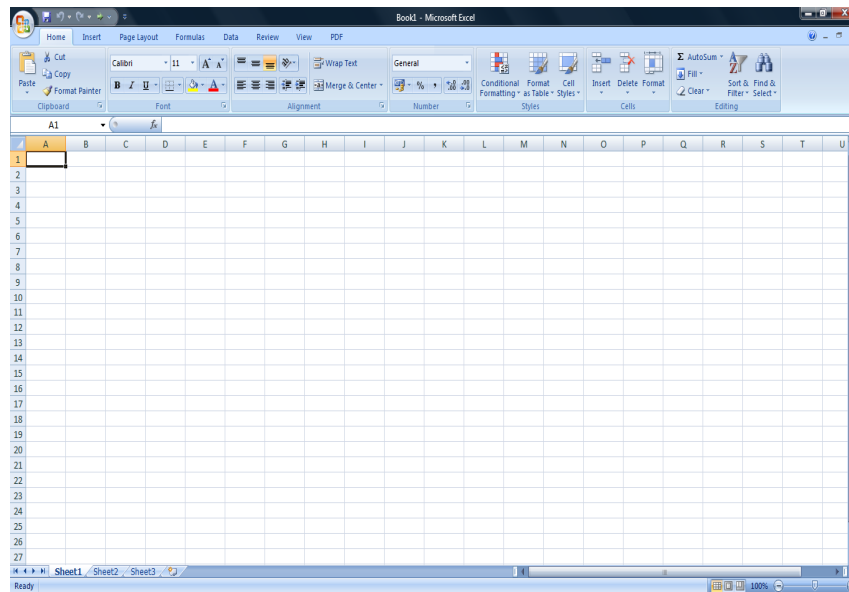
PERIHAL PROGRAM / AKTIVITI / SUB-AKTIVITI	KOD PROGRAM	KOD AKTIVITI	KOD SUB-AKTIVITI	Bil.
PENGURUSAN - (Akt 6, Sub-Akt 7)	010000			
Pengurusan Ibu Pejabat/Negeri		010100	010199	1
Sumber Manusia		010200	010299	2
Kewangan		010300	010399	3
Perancangan Tenaga Manusia dan Latihan		010400		
Perancangan Tenaga Manusia			010401	4
Pengurusan Latihan			010402	5
Teknologi Maklumat Dan Komunikasi		010500	010599	6
Pembangunan Kompetensi		010600	10699	7
KESIHATAN AWAM - (Akt 6, Sub-Akt 13)	020000			
Pengurusan Kesihatan Awam Ibu Pejabat/Negeri		020100	020199	1
Pembangunan Kesihatan Keluarga		020200		
Penjagaan Kesihatan Primer			020201	2
Kesihatan Keluarga			020202	3
Kawalan Penyakit		020300		
Berjangkit			020301	4
Tidak Berjangkit			020302	5
Penyakit Bawaan Vektor			020303	6
AIDS / STD			020304	7
TB / Kusta			020305	8
Survelan			020306	9
Makmal Kesihatan Awam			020307	10
Pendidikan Kesihatan		020400	020499	11
Pemakanan		020500	020599	12

Programme
Code

Software used

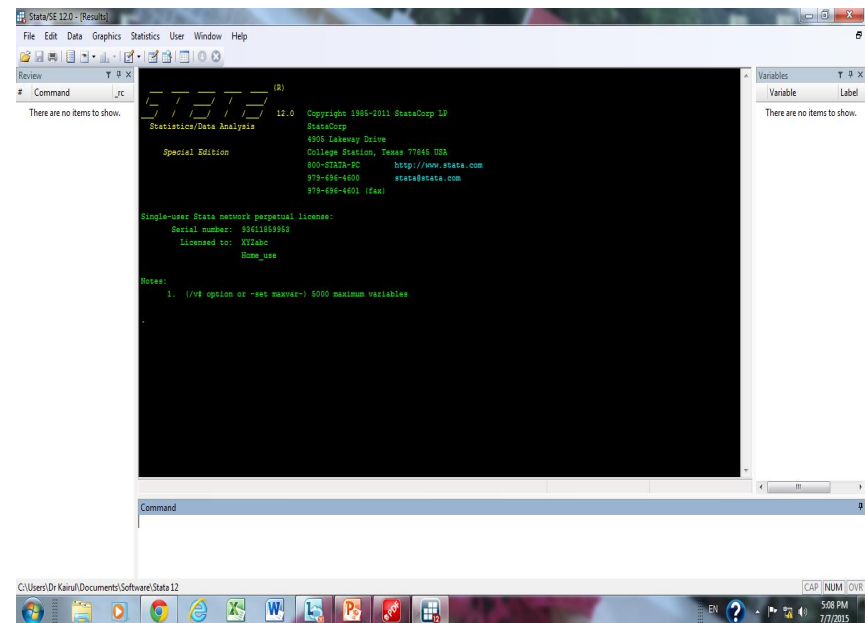
Microsoft Excel

“Cleaning and Filling data gaps



Statistical Software Stata

“Merging, labeling, coding, multiple levels of analysis



Data Analysis Process



AG Data Cleaning

AG DATA CLEANING

- To fill all empty spaces
- Either using STATA or Excel
- Excel- 5 files (1year MOH raw data)

Data Cleaning Process

Microsoft Excel - Laporan Perbelanjaan MOH 2007 10000-12999.xls

File Edit View Insert Format Tools Data Window ProClarity Help

PTJ Header = 010103

	A	B	C	D	E	F	G
1	Laporan Generic Perbelanjaan MOH						
2							
3	Structure		K od Jab = 251				
4	Vot		PTJ Header = 010103				
5	Kod PTJ (Header)						
6	Kod PTJ/PK						
7	Program/Aktiviti						
8	Objek						
9							
10	Chart of accounts	FGCA					
11	Posting period	<= 16					
12	Fiscal Year Variant	Calendar year, 4 spec. periods					
13	Fiscal year	K4/2007					
14	FM area	FGOM					
15	Vot	KEMENTERIAN KESIHATAN					
16	Objek	10000..12999					
17							
18							
19	Vot	Kod PTJ (Header)	Kod PTJ/PKDE	Program/Aktiviti	Objek	Jumlah Perbelanjaan	
20	B42	251010103	FGOM/251010101	B42010100	11101	RM	401,840.01
21					11201		29,818.86
22					11301		198,851.40
23					11601		159.72
24					12101		22,587.50
25					12102		33,525.00
26					12103		10,950.00
27					12107		13,500.00
28					12199		51,800.00
29					12201		2,175.00

Empty cells

Sheet1 Sheet2 Sheet3

Ready

start

Kementerian Kesi... Document1 - Micr... DATA ASAL B42.xls Laporan Perbelanj...

NUM 11:41 AM

Data Cleaning Process

Excel

Microsoft Excel - B42.xls

Type a question for help

E4882 020600

	C	D	E	F	G	H	I
1	KodPTJHe	KodPTJDe	KodProg	KodSODO	Belanja		
2	010103	010101	010100	11101	401840.01		
3	010103	010101	010100	11201	29818.86		
4	010103	010101	010100	11301	198851.4		
5	010103	010101	010100	11601	159.72		
6	010103	010101	010100	12101	22587.5		
7	010103	010101	010100	12102	33525		
8	010103	010101	010100	12103	10950		
9	010103	010101	010100	12107	13500		
10	010103	010101	010100	12199	51800		
11	010103	010101	010100	12201	2175		
12	010103	010101	010100	12202	1620		
13	010103	010101	010100	12299	22100		
14	010103	010101	010100	12301	303190.74		
15	010103	010101	010100	12302	13860		
16	010103	010101	010100	12305	13500		
17	010103	010101	010100	12699	3400		
18	010103	010102	010100	11101	281484.18		
19	010103	010102	010100	11301	149018.76		
20	010103	010102	010100	11601	7301.72		
21	010103	010102	010100	12101	11404.17		
22	010103	010102	010100	12102	41217.5		

Sheet1 / Sheet2 / Sheet3 /

Ready

NUM

11:41 AM

B42.xls

To fill up all empty spaces

Format "number"

Data Analysis Process

GROUPS OF HEALTH FACILITIES

2	State Health Offices
4	PH Laboratories
6	District Health Offices
8	Research Institutions
10	PJ Pharmacy Division

Analysis Process – Labeling & Assigning MNHA codes

- Stata software
- RC code should be reviewed every year
- Labeling code
 - . Stata do.file
 - . All agency labeled based on RC codes
 - . All program and sub program
 - . SODO code

Stata do.file -example

```
Group Kategori.do - Stata Do-file Editor
File Edit Search Tools

generate HQ="0"

IBU PEJABAT (MP6.1a)

replace HQ="Bah.Pengurusan" if KodPTJDe >=010101 & KodPTJDe<=010114
replace HQ="Bah.Sumber" if KodPTJDe>=010201 & KodPTJDe<=010208
replace HQ="Bah.Kewangan" if KodPTJDe>=010301 & KodPTJDe<=010306
replace HQ="Bah.Perancangan & Pembangunan" if KodPTJDe>=010401 & KodPTJDe<=010404
replace HQ="Bah Farmasi" if KodPTJDe==010501
replace HQ="Bah.Perubatan" if KodPTJDe>=010701 & KodPTJDe<=010703
replace HQ="Bah.Kejuruteraan" if KodPTJDe==010901
replace HQ="Bah.Tek.Maklumat & Komunikasi" if KodPTJDe==011201
replace HQ="Bah.(T/CM)" if KodPTJDe>=011301 & KodPTJDe<=011304
replace HQ="Pengurusan Latihan" if KodPTJDe>=010601 & KodPTJDe<=010603
replace HQ="Bah.Kes.Awam" if KodPTJDe>=010801 & KodPTJDe<=010805
replace HQ="Bah.Kes.Pergigian" if KodPTJDe==011001
replace HQ="Kompetensi" if KodPTJDe==011401

=====
```

```
gen cat_2=1 if KodPTJDe>=030101 & KodPTJDe<=030154
replace cat_2=2 if KodPTJDe>=062701 & KodPTJDe<=062754
replace cat_2=3 if KodPTJDe>=050101 & KodPTJDe<=050154
replace cat_2=4 if KodPTJDe>=020101 & KodPTJDe<=020154
replace cat_2=5 if KodPTJDe>=060101 & KodPTJDe<=060154
replace cat_2=6 if KodPTJDe>=130101 & KodPTJDe<=130154
replace cat_2=7 if KodPTJDe>=120101 & KodPTJDe<=120154
replace cat_2=8 if KodPTJDe>=100101 & KodPTJDe<=100154
replace cat_2=9 if KodPTJDe>=150101 & KodPTJDe<=150154
replace cat_2=10 if KodPTJDe>=080101 & KodPTJDe<=080154
replace cat_2=11 if KodPTJDe>=040101 & KodPTJDe<=040154
replace cat_2=12 if KodPTJDe>=270101 & KodPTJDe<=270154
replace cat_2=13 if KodPTJDe>=140101 & KodPTJDe<=140154
replace cat_2=14 if KodPTJDe>=062601 & KodPTJDe<=062654
replace cat_2=15 if KodPTJDe>=062801 & KodPTJDe<=062854
replace cat_2=16 if KodPTJDe>=070101 & KodPTJDe<=070154
replace cat_2=17 if KodPTJDe>=090101 & KodPTJDe<=090154
replace cat_2=18 if KodPTJDe>=062401 & KodPTJDe<=062454
label var cat_2 "tertiary specialist"
label define lcat_2 1 "Hos Alor Setar" 2 "Hos Ampang" 3 "Hos Ipoh" 4 ""
label values cat_2 lcat_2
```

Output of Labeling process -example

Stata Results

. tab HQ

HQ	Freq.	Percent	Cum.
O	150,293	97.84	97.84
Bah Farmasi	190	0.12	97.97
Bah.(T/CM)	97	0.06	98.03
Bah.Kejuruteraan	160	0.10	98.14
Bah.Kes.Awan	695	0.45	98.59
Bah.Kes.Pergigian	117	0.08	98.66
Bah.Kewangan	714	0.46	99.13
Bah.Pengurusan	625	0.41	99.54
Bah.Perancangan & Pembangunan	96	0.06	99.60
Bah.Perubatan	135	0.09	99.69
Bah.Sumber	184	0.12	99.81
Bah.Tek.Maklumat & Komunikasi	87	0.06	99.86
Kompetensi	87	0.06	99.92
Pengurusan Latihan	124	0.08	100.00
Total	153,604	100.00	

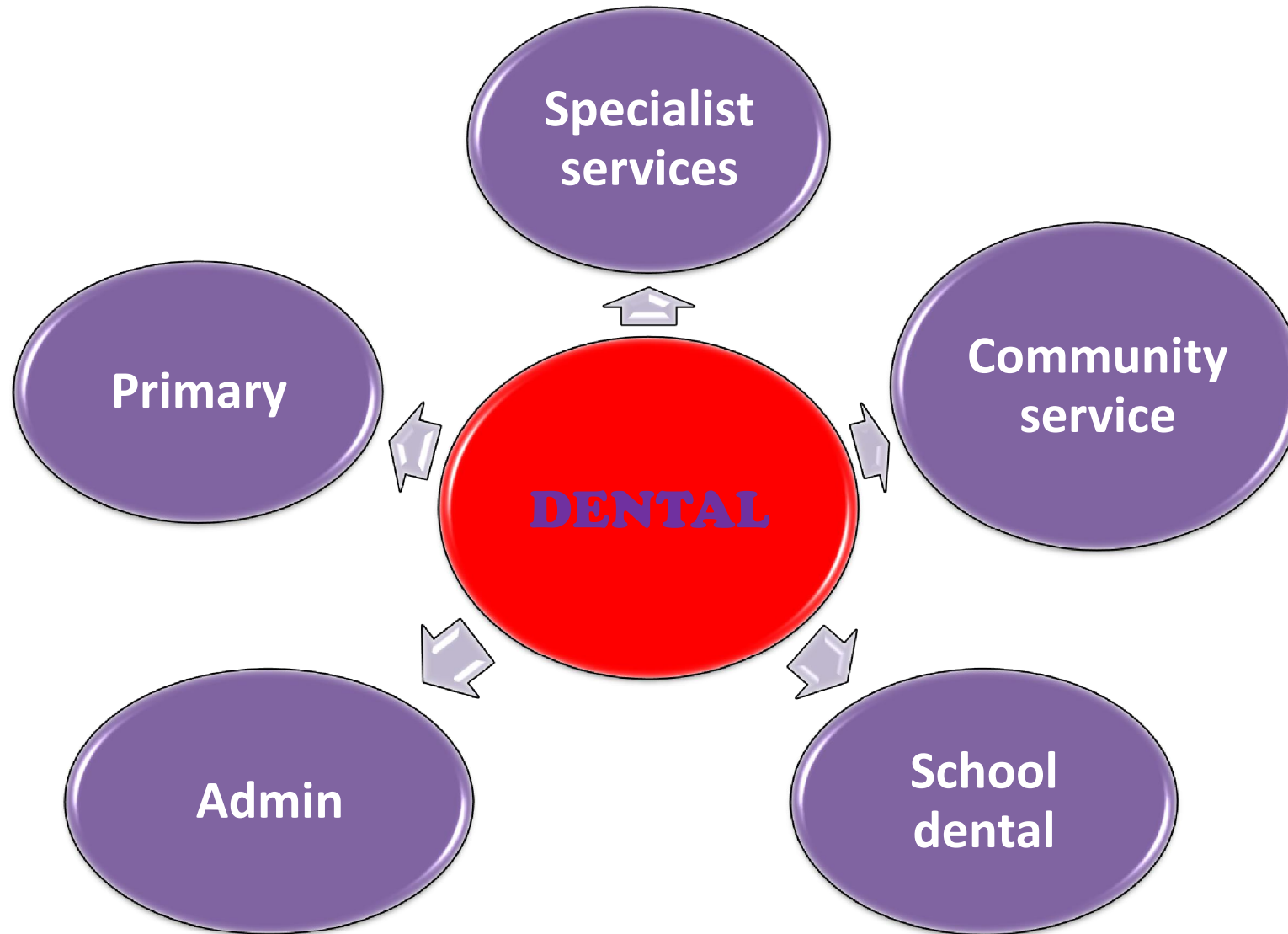
. tab cat_2

tertiary specialist	Freq.	Percent	Cum.
Hos Alor Setar	1,409	5.55	5.55
Hos Ampang	1,322	1.27	6.82
Hos Ipoh	2,797	11.02	17.84
Hos Tg Fauziah	1,177	4.64	22.48
Hos Tg Ampuan Rahimah	1,539	6.06	28.55
Hos Kota Bharu	1,500	5.91	34.46
Hos Pakar K Terengganu	1,099	4.33	38.79
Hos Tg Ampuan Afzan	921	3.83	42.61
Hos Kuching	1,380	5.44	48.05
Hos Melaka	1,586	6.25	54.30
Hos P Pinang	2,542	10.02	64.32
Hos Putrajaya	660	2.60	66.92
Hos Queen Elizabeth	1,438	5.67	72.59
Hos Selayang	1,694	6.68	79.26
Hos Serdang	657	2.59	81.85
Hos Seremban	2,184	8.61	90.46
Hos Sultanah Aminah	1,598	6.30	96.75
Hos Sg Buloh	824	3.25	100.00
Total	25,377	100.00	

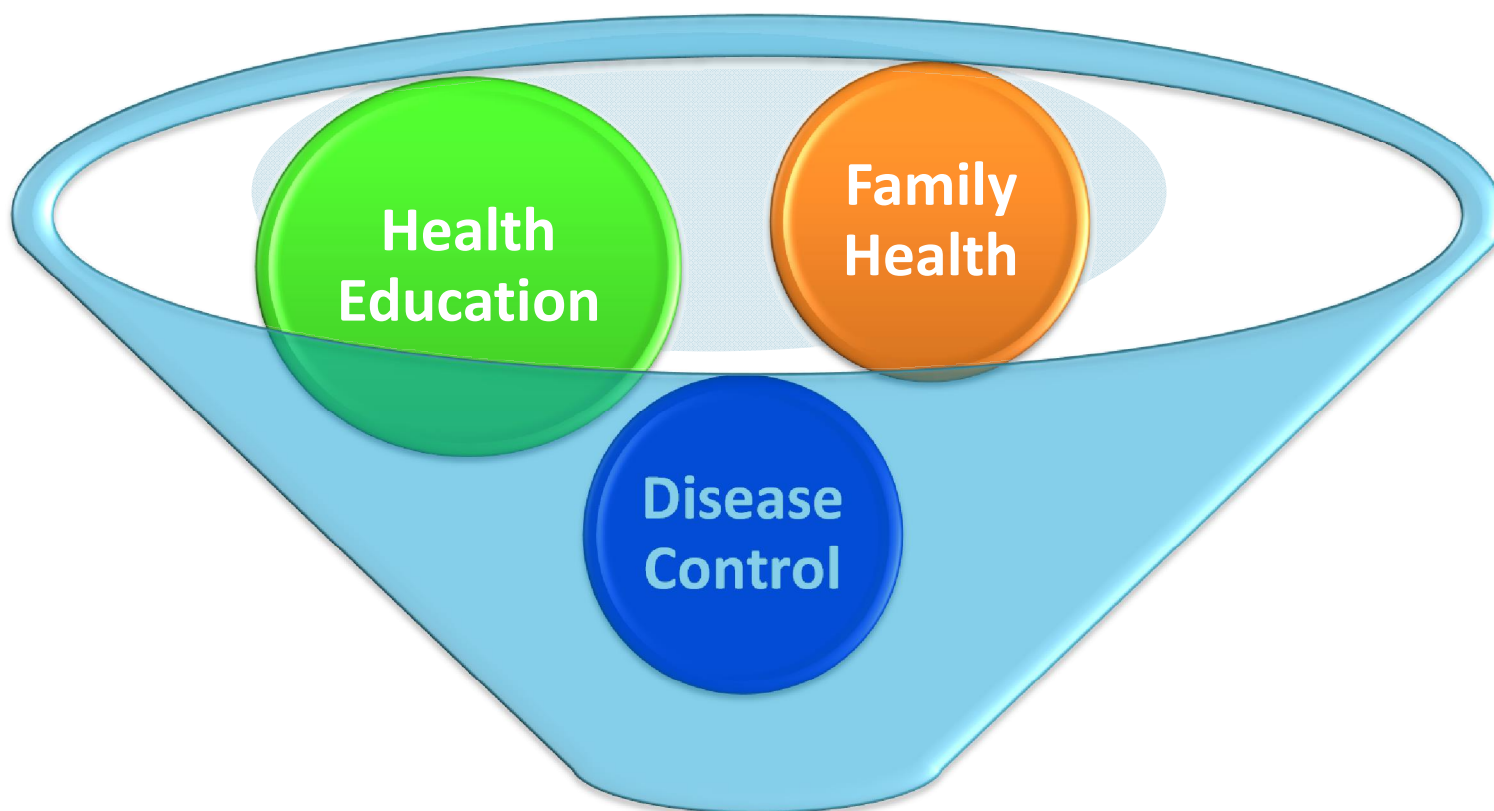
Assign MNHA Codes - MS MP MF

- “ Each agency will be labeled based on RCC code for source MS, provider MP ,function MF and state codes
- “ Each agencies have dif rules & allocation to assign MNHA codes
- “ Example: MOH Hospital
 - Re classified by MNHA categories based on Medical Practice Division, MOH Hospital list
 - Function IP OP & DC code using hospital costing study (2002)

Rules - Dental



Rules –District Health Officer



DISTRICT HEALTH OFFICE

Final MOH Output

Write a Stata do.file

- ❑ For each of 11 group of Health facility need to realign analyze data to standardized format (10D=Dual coding SHA& MNHA, expenditure , year, state, id code)

Final MOH Output (10D)

Data Editor (Browse) - [HOSPITAL10D_97-15.dta]

File Edit View Data Tools

year[1] 1997

	year	state	agency	mnhasource	mnhaprovider	mnhafunction	exp	ichasource	ichaprovider	ichafunction
1	1997	14	1111011401	1111	1102	1200	3469.6167	111	110	120
2	2007	14	1111011401	1111	1102	1100	1978.3655	111	110	110
3	2004	14	1111011401	1111	1102	1100	1602.7	111	110	110
4	2003	14	1111011401	1111	1102	1200	65.688	111	110	120
5	2003	14	1111011401	1111	1102	1200	8.993	111	110	120
6	2008	14	1111011401	1111	1102	1100	775.8525	111	110	110
7	2008	14	1111011401	1111	1102	1100	280.58906	111	110	110
8	1998	14	1111011401	1111	1102	1200	4297.481	111	110	120
9	2004	14	1111011401	1111	1102	1100	348.0773	111	110	110
10	2004	14	1111011401	1111	1102	1100	4542.926	111	110	110
11	2009	14	1111011401	1111	1102	1200	781.79786	111	110	120
12	2003	14	1111011401	1111	1102	1100	38783.009	111	110	110
13	2007	14	1111011401	1111	1102	1100	2808.3675	111	110	110
14	2006	14	1111011401	1111	1102	1200	83.0875	111	110	120
15	2004	14	1111011401	1111	1102	1100	3569.65	111	110	110
16	2007	14	1111011401	1111	1102	1200	41.446	111	110	120
17	2001	14	1111011401	1111	1102	1200	3649.1354	111	110	120
18	2002	14	1111011401	1111	1102	1100	262.26	111	110	110
19	2003	14	1111011401	1111	1102	1200	2846.9973	111	110	120
20	2011	14	1111011401	1111	1102	1100	20158.914	111	110	110
21	2008	14	1111011401	1111	1102	1200	21172.479	111	110	120
22	2002	14	1111011401	1111	1102	1100	52.81625	111	110	110
23	2001	14	1111011401	1111	1102	1200	1276.3311	111	110	120
24	2001	14	1111011401	1111	1102	1100	19924.475	111	110	110
25	2003	14	1111011401	1111	1102	1100	3726.8749	111	110	110
26	2003	14	1111011401	1111	1102	1100	98744.533	111	110	110
27	2009	14	1111011401	1111	1102	1100	539.8185	111	110	110
28	2005	14	1111011401	1111	1102	1100	3347.3847	111	110	110

Ready

Vars: 10 Order: Dataset Obs: 4,327,346 Filter: Off Mode: Browse CAP NUM

Variables

Filter variables here

Variable	Label
<input checked="" type="checkbox"/> year	
<input checked="" type="checkbox"/> state	
<input checked="" type="checkbox"/> agency	
<input checked="" type="checkbox"/> mnhasource	
<input checked="" type="checkbox"/> mnhaprovider	
<input checked="" type="checkbox"/> mnhafunction	
<input checked="" type="checkbox"/> exp	
<input checked="" type="checkbox"/> ichasource	
<input checked="" type="checkbox"/> ichaprovider	
<input checked="" type="checkbox"/> ichafunction	

Properties

Variables

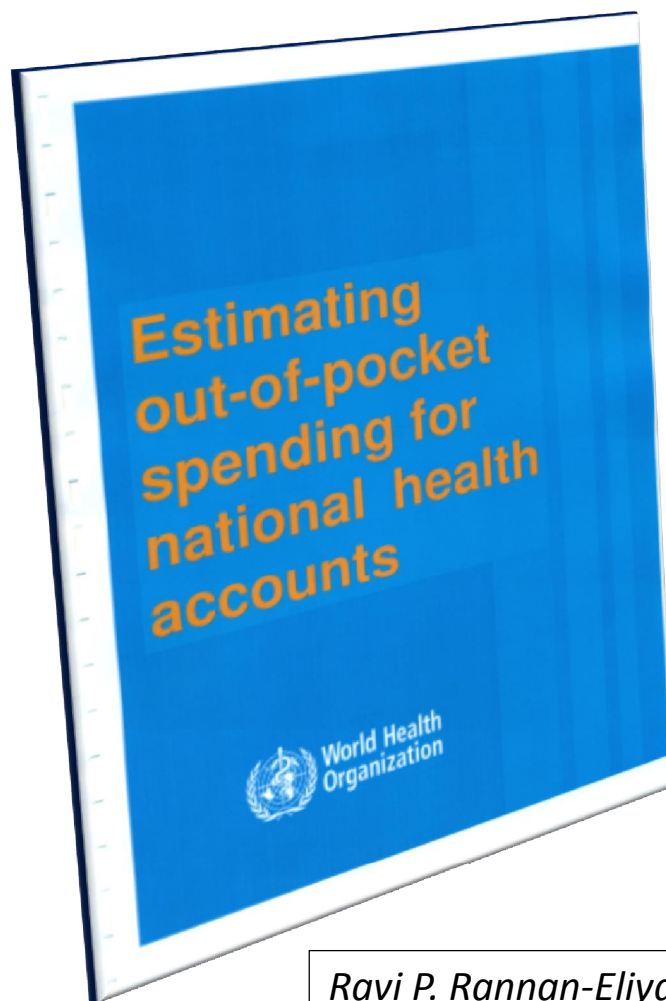
Name	year
Label	
Type	float
Format	%10.0g
Value Label	
Notes	

Data

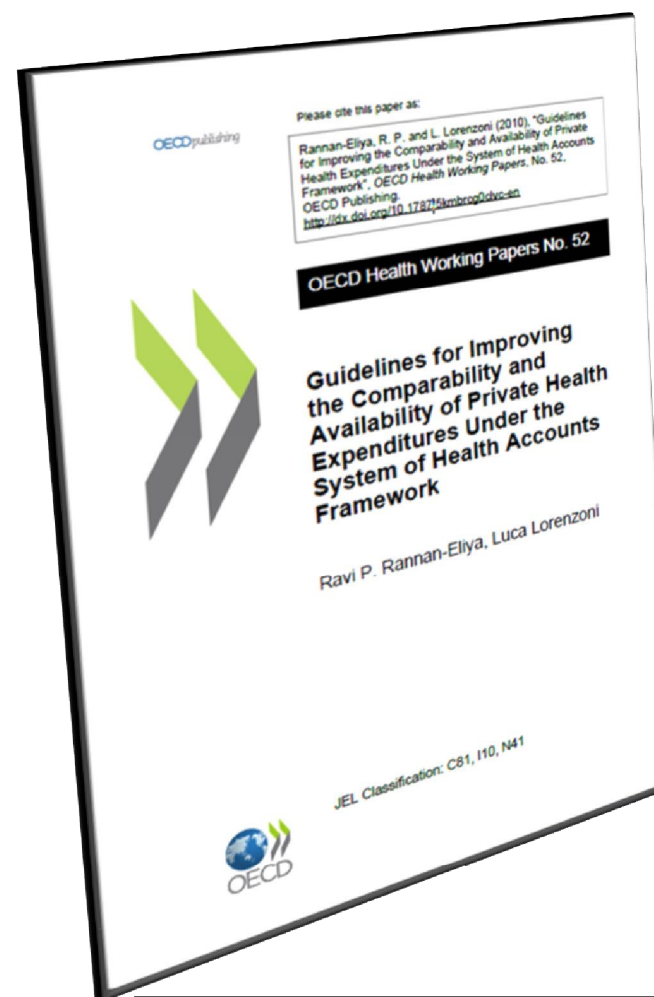
Filename	HOSPITAL10D_97
Label	
Notes	
Variables	10
Observations	4,327,346
Size	148.57M

OUT-OF-POCKET (OOP)

OOP Estimation Reference



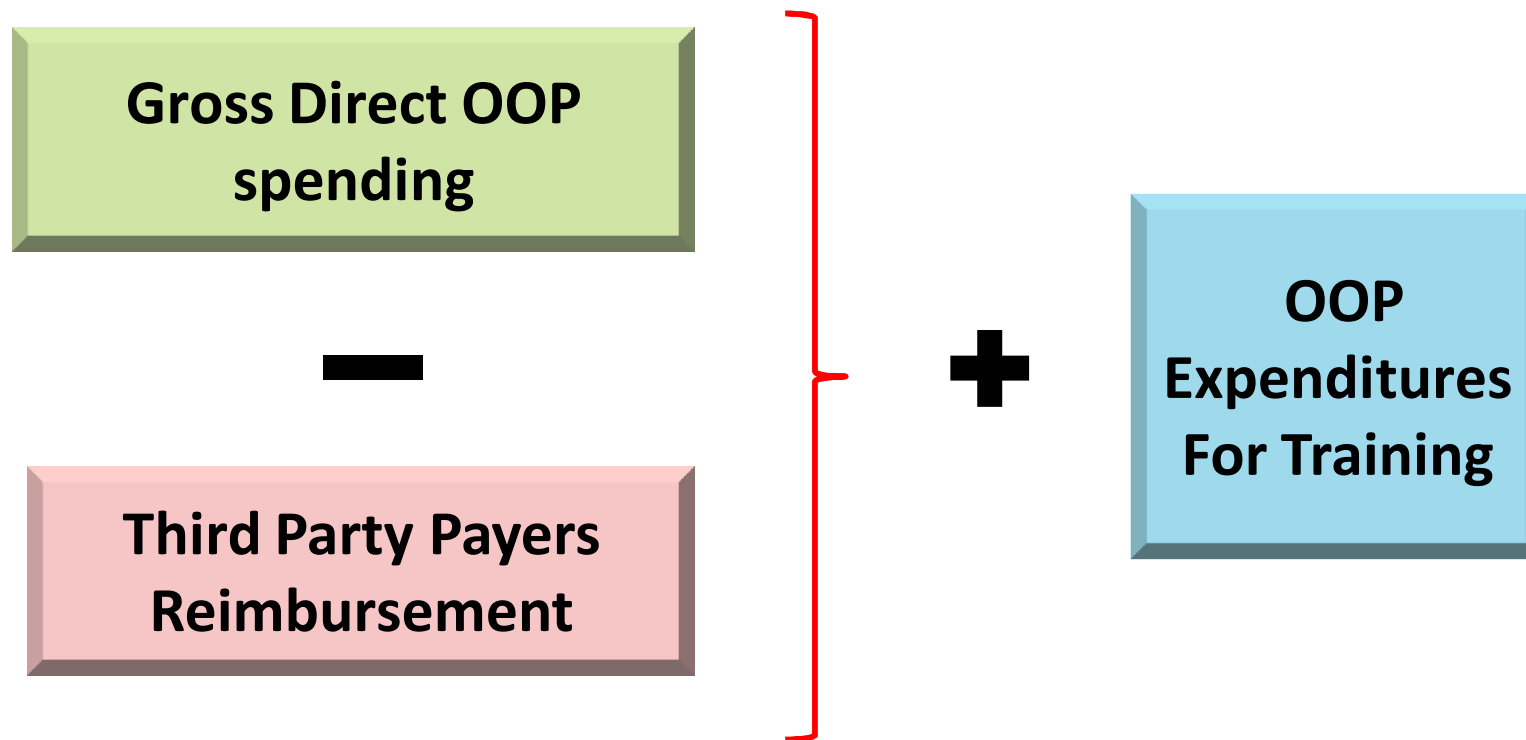
*Ravi P. Rannan-Eliya
WHO, Geneva, 2010*



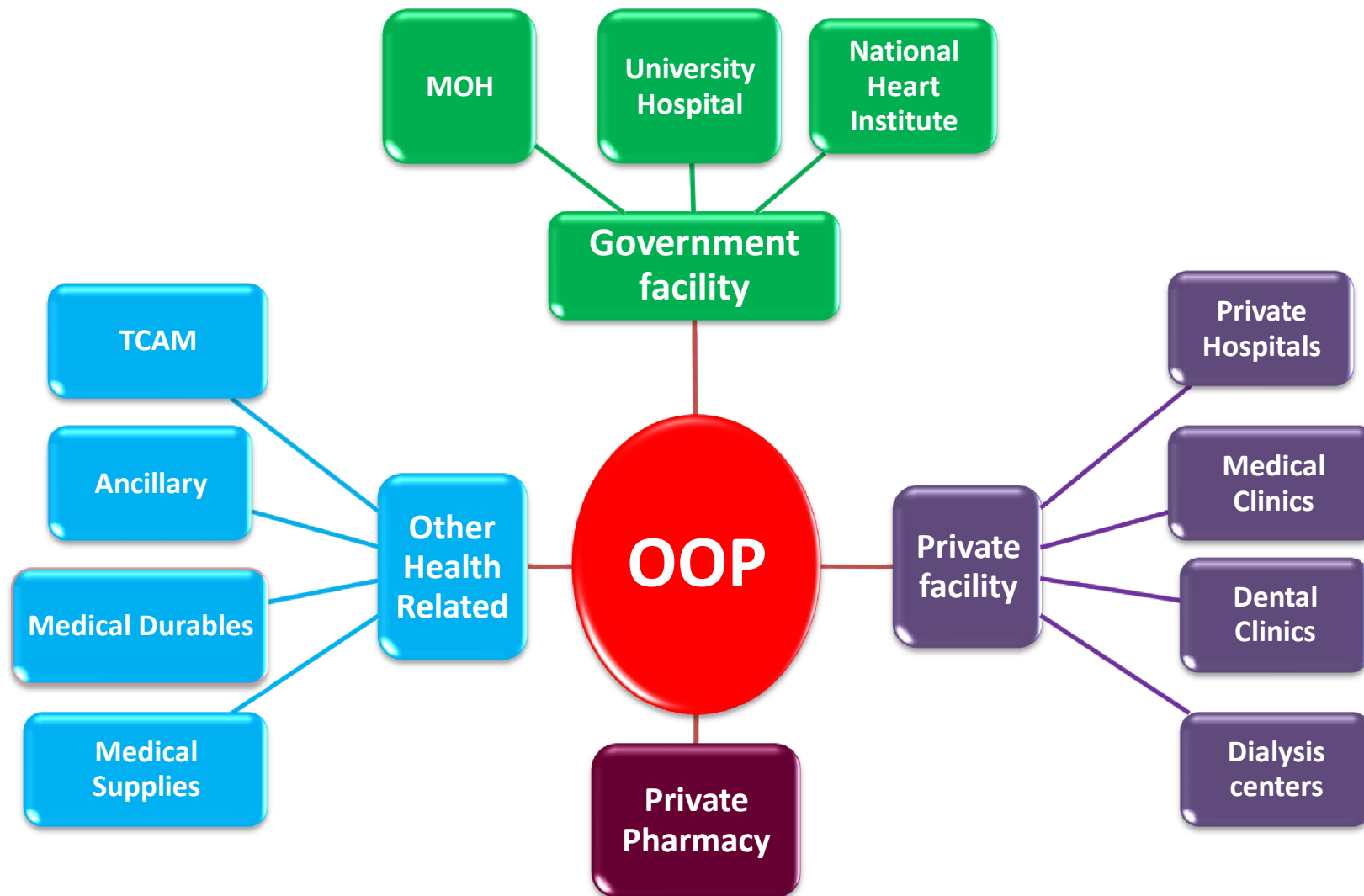
*Rannan-Eliya, R. P. & L. Lorenzoni (2010),
OECD Health Working Papers, No. 52,*

Integrated Approach

OOP Expenditure: consumption, provision & financing approach

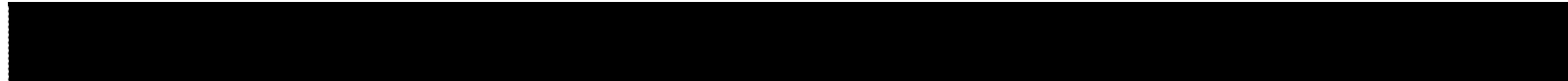


Where Does OOP Payments Occur? (Providers)

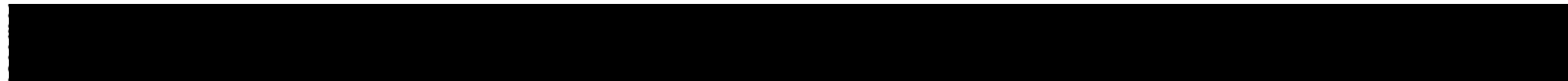


Gross OOP Direct Spending

1 Ministry of Health User Charges



3 National Heart Institute (IJN) User Charges



5 Private Clinics Gross Revenues



7 Private Hemodialysis



9 Medical Supplies

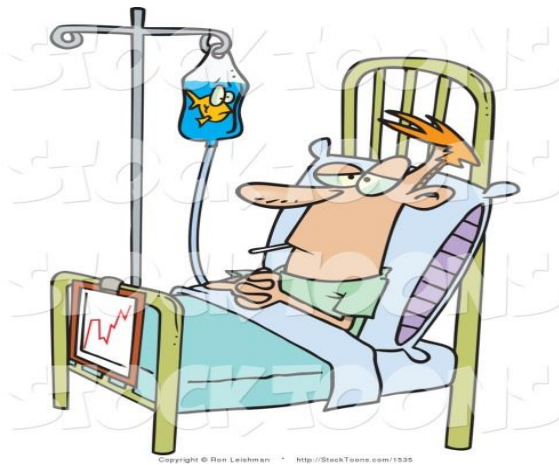


11 Ancillary Services

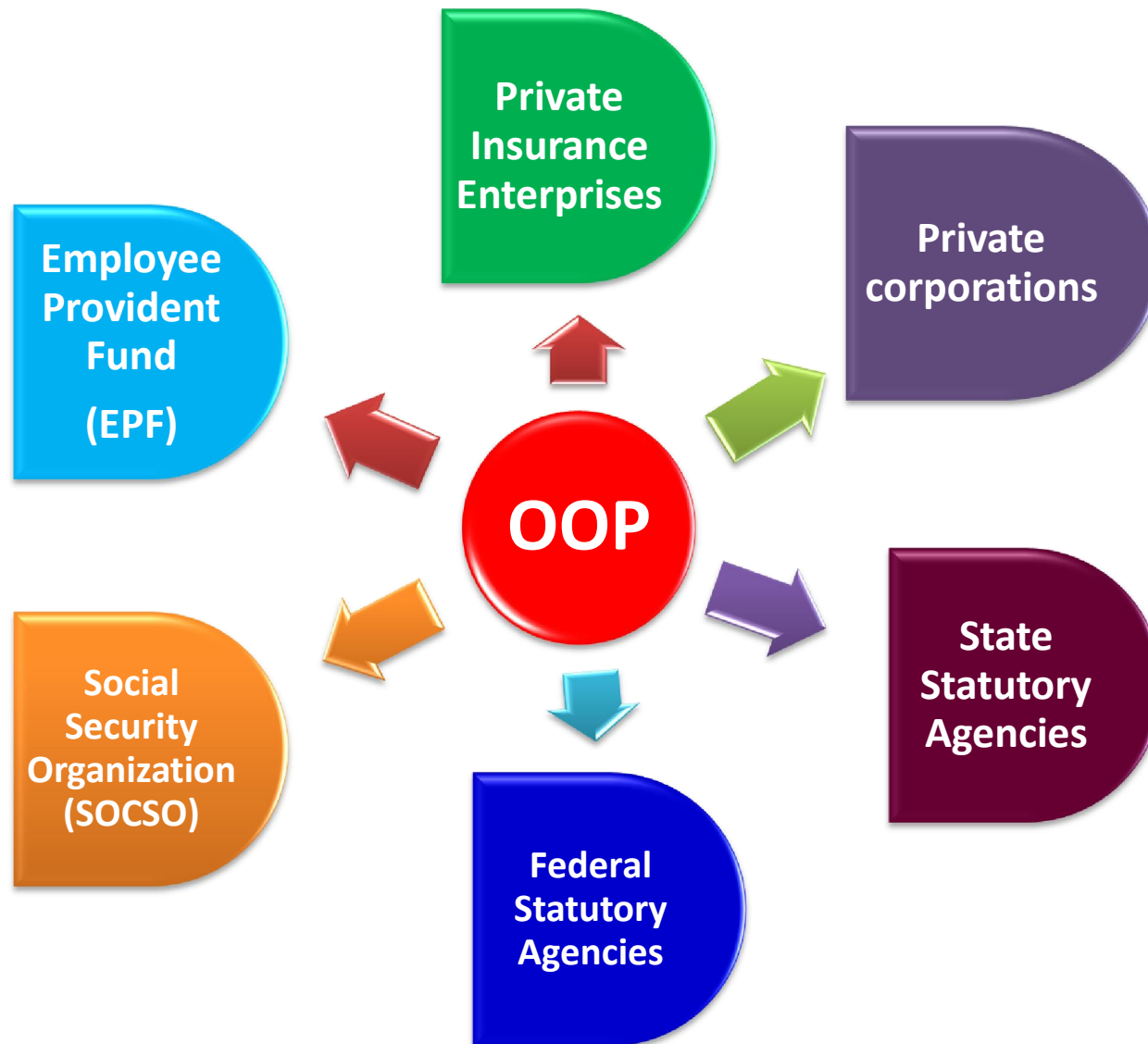


13 Traditional Treatment Provider

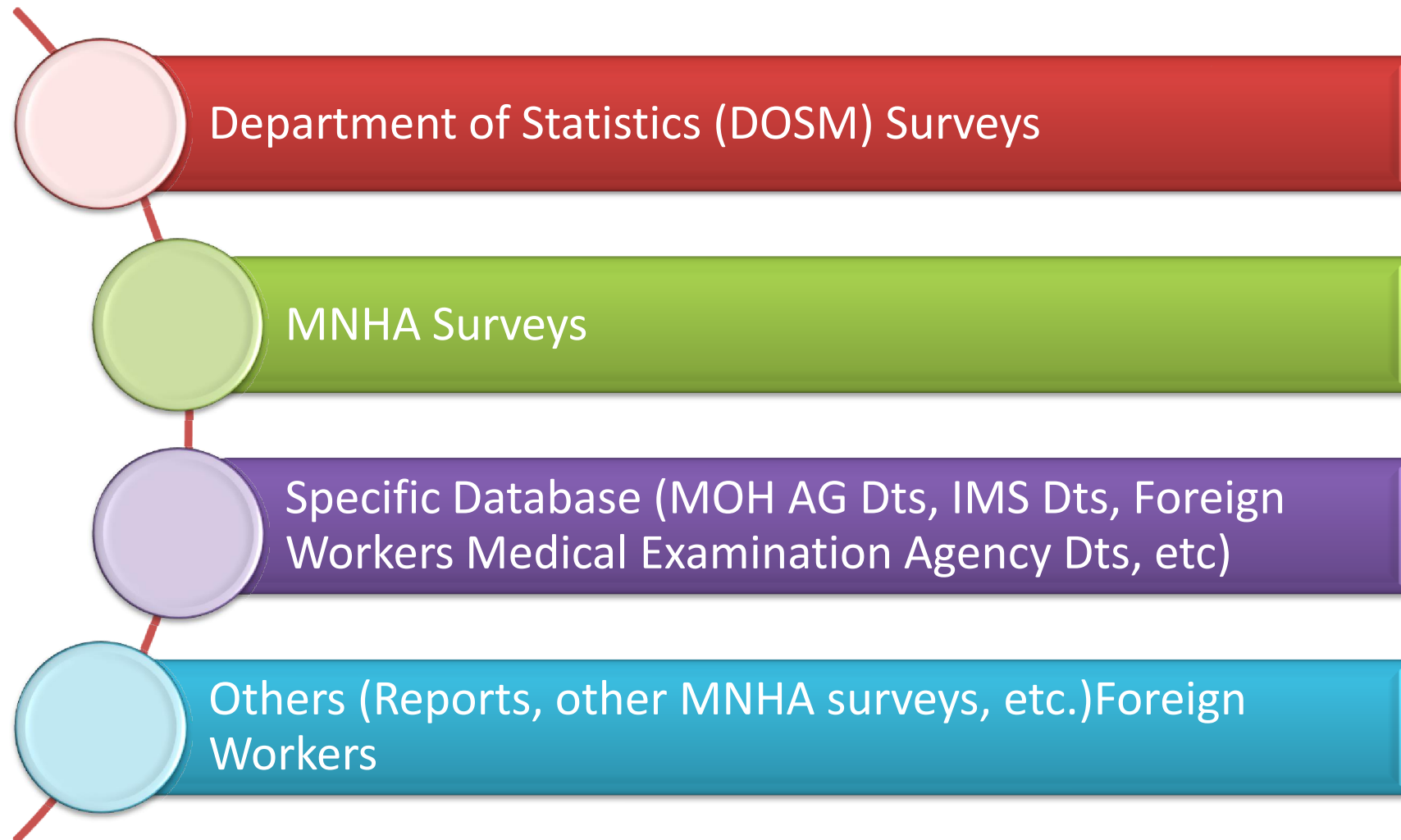
Payments & Reimbursements



Reimbursement (Third Party Payers)



OOP Data Sources



Data Analysis

➤ Software

- Microsoft Excel
- Stata (Data analysis & statistical software)
 - MOH revenue
 - Household Expenditure surveys
 - Reimbursement deduction process

- To understand flow of fund from source of funding to consumer for each agency
- To do multiple analysis for each agency either from gross spending or third party payers groups

Data Analysis

➤ Missing value & data gap

- ❑ Mean/average/use previous year value

- ❑ Imputation techniques:

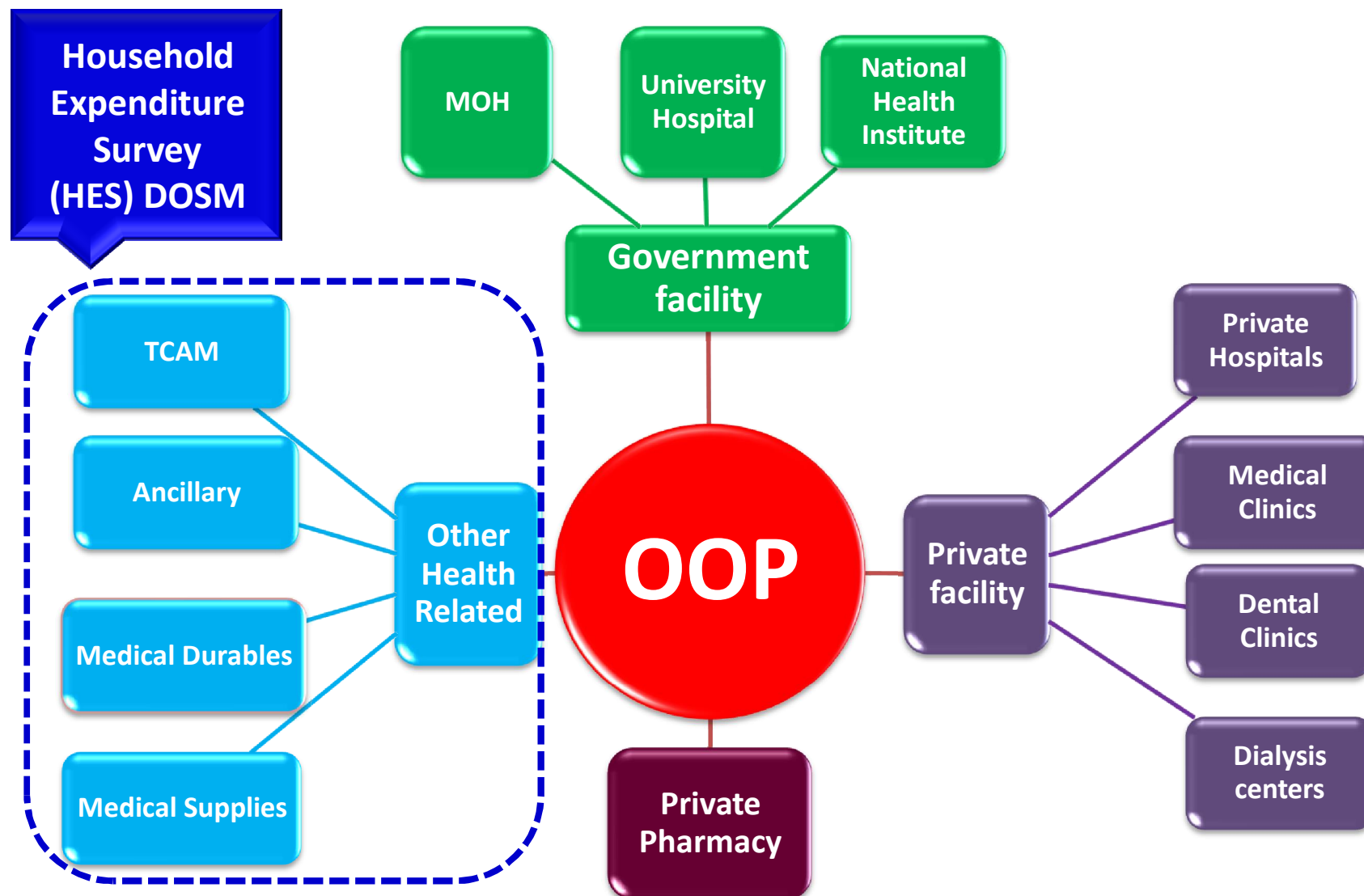
- Refer to Annex D in Producers Guide usually using indicators and inflation measures

- Interpolation, extrapolation +/- indicators/variables (GDP, GDP deflator, population, log linear equation, etc.)

Private Facility

- Private Hospital, Private Medical Clinic and Private Dental data sources
 - Medical Practice Division, MOH – data source list
 - DOSM -Total expenditure data
 - “Rolling study’
 - Missing value and data gap
 - MNHA Surveys- Breakdown by provider and function

Other Health Related Expenditure



OOP Other Health Related Expenditure

- “ Reviewed previous 4 series of HES (1994, 1998, 2004, 2014) by individual codes in Category 6 of the survey (health spending) to match similar items before allocating MNHA codes
- “ Used HES 2014 survey as basis/reference to disaggregate expenditures as this set had most number of disaggregated household expenditure

OOP Other Health Related Expenditure

- “ Cross check with IMS codes to avoid double coding
- “ HES 2014 survey has most details of Dental expenditure which was aggregated for NHA as Private Dental Clinic expenditures except expensive items such as braces, prosthesis, etc. coded separately

Third party deduction

- Used Stata software
- Compile all gross spending and minus all third party payers (reimbursement)
- Finally 10D OOP expenditure with dual code, state, year and ID code

Final OOP Output (10D)

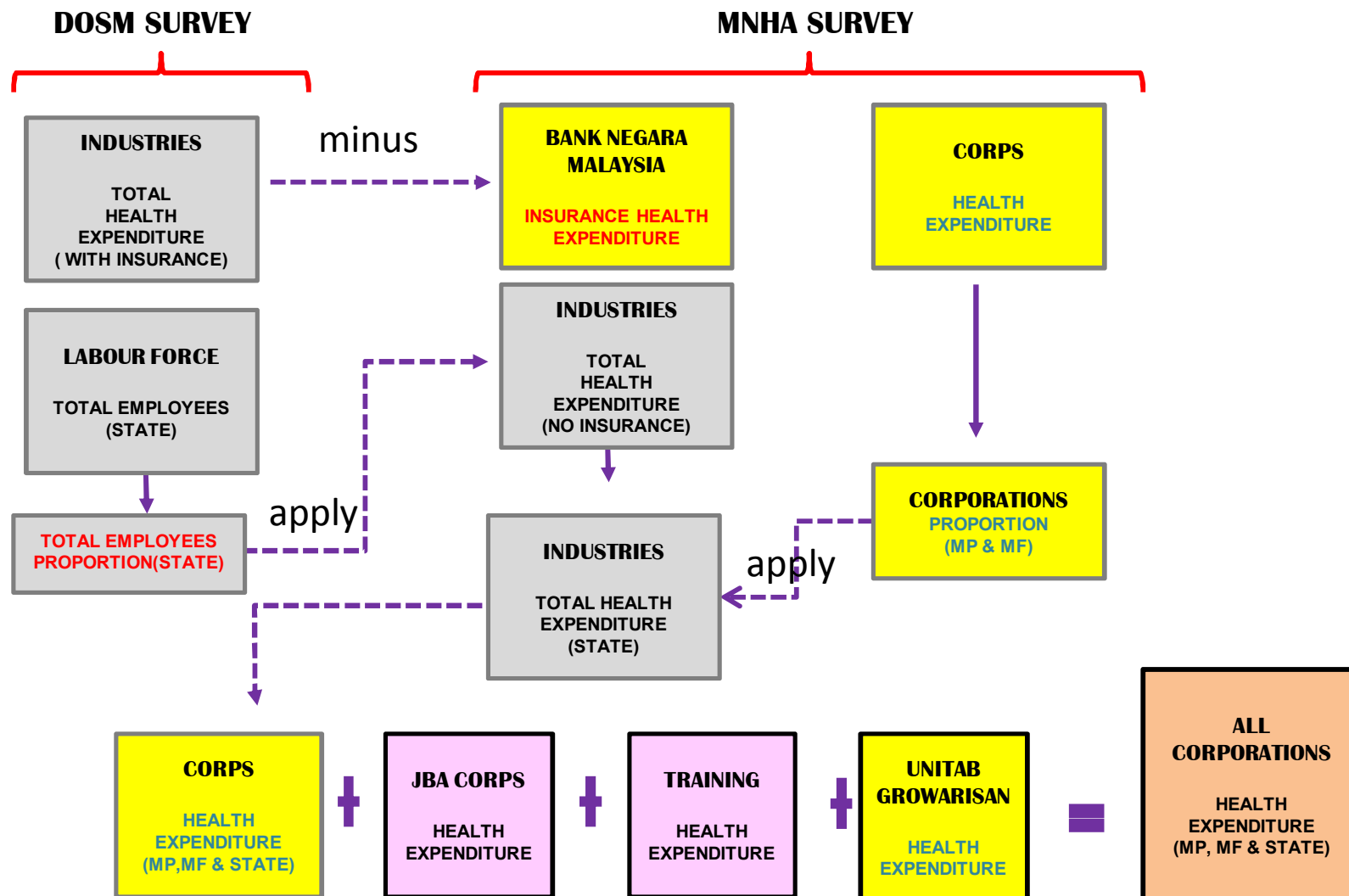
N13													
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	year	state	agency	mnhasource	mnhaprovider	mnhafunction	exp	ichasource	ichaprovider	ichafunction			
2	1997	1	2406000000	2400	1101	1100	8445864.39	230	110	110			
3	1997	2	2406000000	2400	1101	1100	3728642.23	230	110	110			
4	1997	3	2406000000	2400	1101	1100	1478924.68	230	110	110			
5	1997	4	2406000000	2400	1101	1100	1846429.39	230	110	110			
6	1997	5	2406000000	2400	1101	1100	2496042.52	230	110	110			
7	1997	6	2406000000	2400	1101	1100	2702260.33	230	110	110			
8	1997	7	2406000000	2400	1101	1100	4356016.39	230	110	110			
9	1997	8	2406000000	2400	1101	1100	4568433.11	230	110	110			
10	1997	9	2406000000	2400	1101	1100	499868.10	230	110	110			
11	1997	10	2406000000	2400	1101	1100	13301600.67	230	110	110			
12	1997	11	2406000000	2400	1101	1100	1503848.86	230	110	110			
13	1997	12	2406000000	2400	1101	1100	6386076.13	230	110	110			
14	1997	13	2406000000	2400	1101	1100	4884588.07	230	110	110			
15	1997	14	2406000000	2400	1101	1100	5885260.45	230	110	110			
16	1997	15	2406000000	2400	1101	1100	264082.95	230	110	110			
17	1997	16	2406000000	2400	1101	1100	2022075.82	230	110	110			
18	1997	1	2406000000	2400	3101	1310	1340866.73	230	310	131			
19	1997	2	2406000000	2400	3101	1310	635648.42	230	310	131			
20	1997	3	2406000000	2400	3101	1310	457314.12	230	310	131			
21	1997	4	2406000000	2400	3101	1310	311097.68	230	310	131			
22	1997	5	2406000000	2400	3101	1310	453827.23	230	310	131			
23	1997	6	2406000000	2400	3101	1310	534685.64	230	310	131			
24	1997	7	2406000000	2400	3101	1310	365820.23	230	310	131			
25	1997	8	2406000000	2400	3101	1310	918426.08	230	310	131			
26	1997	9	2406000000	2400	3101	1310	110805.51	230	310	131			
27	1997	10	2406000000	2400	3101	1310	1334490.59	230	310	131			

ALL CORPORATION

Data Source

- 1) Department Statistic of Malaysia (DOSM)
 - Industrial Surveys
 - Labour Forces Survey
- 2) All Corporation
 - Berhad (Private Limited) Companies
 - Small Medium Enterprises (SME)Companies
- 3) BNM
 - Grouped Insurance
- 5) Others
 - JPA, Public & Private Institute
 - UniTab & GROWARISAN

Analysis Methodology



References- examples





THANK YOU