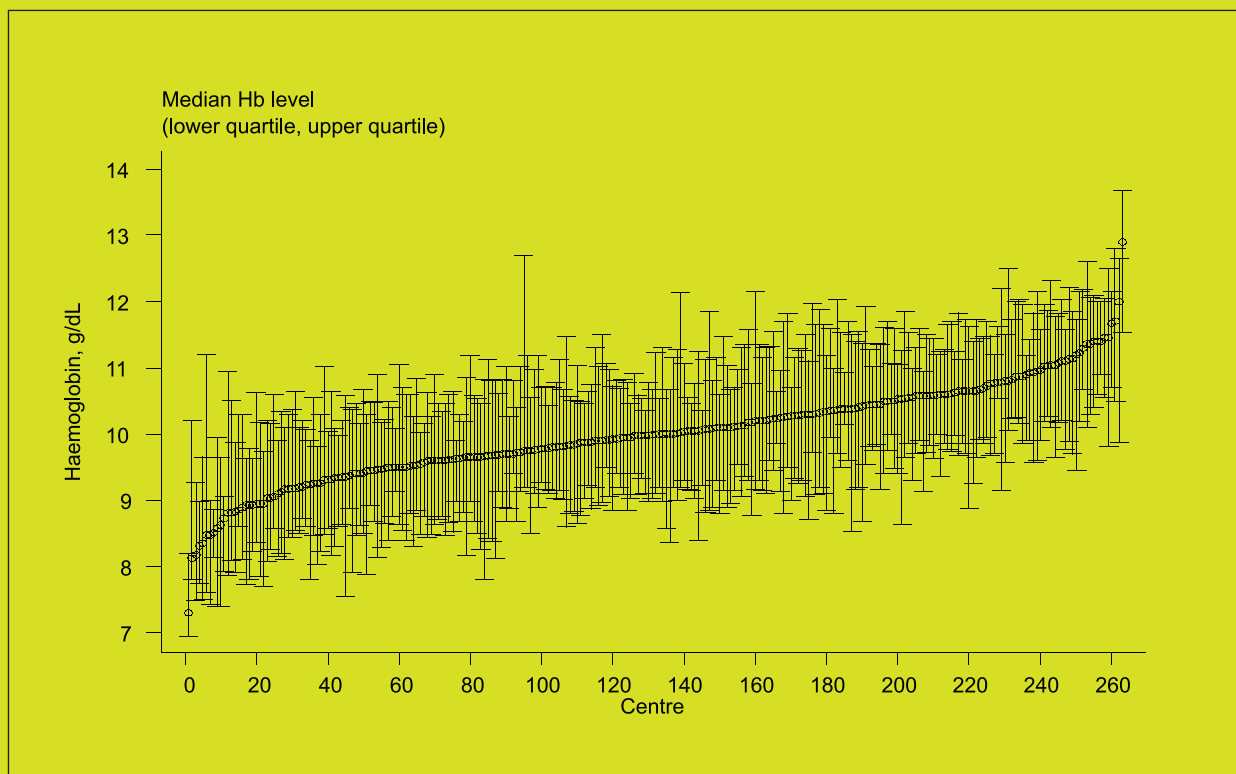


# 14<sup>TH</sup> REPORT OF THE MALAYSIAN DIALYSIS & TRANSPLANT REGISTRY 2006



Edited by:  
**Y N Lim,**  
**T O Lim**

With contributions from:

**Rozina G, Zaki Morad, Wong HS, Liu WJ, Lee ML, Philip N J, Ahmad Fauzi,  
Prasad M, Fan KS, Teo SM, Tan CC, Sunita B, Goh BL, Lee DG, Sharon Chen**



**Malaysian Society of Nephrology**



**Association of Dialysis  
Medical Assistants and Nurses**

**14<sup>TH</sup>REPORT  
OF THE MALAYSIAN  
DIALYSIS & TRANSPLANT REGISTRY  
2006**

Sponsors:

**Malaysian Society of Nephrology  
Association of Dialysis Medical Assistants and Nurses**

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**The National Renal Registry**

Malaysian Society of Nephrology

2<sup>nd</sup> Floor, MMA House

124, Jalan Pahang

50286 Kuala Lumpur

Malaysia

Telephone : (603) 4045 8636

Direct Fax : (603) 4042 7694

e-mail : [nrr@msn.org.my](mailto:nrr@msn.org.my)

Web site : <http://www.msn.org.my/nrr>

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This report is copyrighted. However it may be freely reproduced without the permission of the National Renal Registry. Acknowledgment would be appreciated. Suggested citation is: YN Lim, TO Lim (Eds). Fourteenth Report of the Malaysian Dialysis and Transplant Registry 2006. Kuala Lumpur 2007

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Our industry sponsors

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**Baxter Healthcare**

**Fresenius Medical Care**

**Roche**

The staff of the Clinical Research Centre for IT and statistical support

**The National Transplant Registry**

&

**All who have in one way or another supported the National Renal Registry**

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2006 to 2008**

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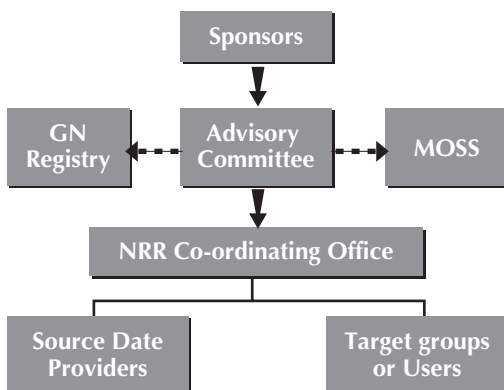
# About the National Renal Registry

The National Renal Registry (NRR) has its origin in the Dialysis and Transplant Registry established by the Department of Nephrology in 1992. The sponsors of NRR are the Malaysian Society of Nephrology (MSN) and Association of Dialysis Medical Assistants and Nurses (ADMAN)

### The objectives of NRR are to:

1. Determine the disease burden attributable to End Stage Renal Disease (ESRD), and its geographic and temporal trends in Malaysia.
2. Determine the outcomes, and factors influencing outcomes of Renal Replacement Therapy.
3. Evaluate the RRT program.
4. Stimulate and facilitate research on RRT and ESRD.
5. Maintain the national renal transplant waiting list.

### The NRR organization is as follows:



### Sponsors

The Malaysian Society of Nephrology is the sponsor of the National Renal Registry (NRR) and Malaysian Organ Sharing System (MOSS) and the co-sponsor is the Association of Dialysis Medical Assistants and Nurses.

### Advisory Committee

This is the committee established by the sponsors to oversee the operations of the registry and MOSS. Interested parties including source data producers, Renal Registry Unit and target groups or users are represented on this committee.

### National Renal Registry Office

The NRR office is the coordinating center that collects and analyses the data. It publishes the annual report of Malaysian Dialysis & Transplant Registry and the Directory of Dialysis Centres in Malaysia. The Clinical Registry Manager (CRM) oversees the daily operation of the NRR. The Clinical Research Centre of Hospital Kuala Lumpur provides the epidemiological, statistical and information technological support to NRR.

### Source Data Producers

These are the dialysis centres that collect the required data. It is the most critical and yet difficult element of the system. It has to be systematic and uniform, and producers of source data need to be trained and motivated to ensure high data quality.

### Users or Target groups

These are the individuals or institutions to whom the regular registry reports are addressed. It is their need for information to assist in the planning and implementing disease treatment, control and prevention activity that justify the investment in the registry. They include:

1. the renal community
2. the RRT provider
3. the public health practitioner
4. the decision maker in various government and non-government agencies who have responsibilities for any aspects of ESRD treatment, prevention and control
5. the researcher with an interest in ESRD and RRT.
6. the press and the public.

## About MOSS

Malaysian Organ Sharing System or MOSS has been upgraded to web application named e-MOSS. It was officially launched by Y. B. Dato Dr. Hj. Abd Latiff B Ahmad, the Deputy Minister of Health, Malaysia on 1<sup>st</sup> September 2006.

It is managed by the MOSS committee established under the Malaysian Society of Nephrology (MSN), with National Renal Registry (NRR) assisting in its daily operations.

### The functions of the MOSS committee are:

1. Make policy decisions concerning MOSS.
2. Secure funding from various sources to support its operation.
3. Designate a place to be the coordinating centre.
4. Canvass the views of nephrologists and other clinical staff involved concerning its policies and operations.
5. Appoint panel of nephrologists to assist in the potential recipient management.

### The objectives of e-MOSS

1. To maintain a list of patients who have voluntarily enrolled as potential recipients in the cadaveric kidney transplantation program in Malaysia.
2. To prioritise the waiting list according to an agreed criteria and its scoring system.
3. To update the waiting lists according to the specified criteria.
4. To provide a list of suitably matched potential recipients when a cadaver organ is available.
5. To facilitate centres to effectively manage the patients' listing.

### The role of e-MOSS:

All patients registered with NRR will be included in the e-MOSS. However, the subsequent management of the patients' lists depends on the participating centres.

1. The doctor caring for dialysis patients who are potential recipients can now efficiently maintain their patients on the lists and update their patients' treatment information regularly.

2. The transplant coordinating centres can now access the potential recipients' listing that is ranked according to the pre-determined criteria. The patient could be easily contactable in the event of organ donation.

### Participation in e-MOSS:

This system is located in a secured site; <https://www.macr.org.my/emoss>. There are link provided from <http://msn.org.my> or <http://msn.org.my/nrr>. All dialysis centres are welcome to be an e-MOSS user.

### How to register with e-MOSS?

1. The dialysis centre needs to register as an e-MOSS user. Registration instruction and its documents are available in this web application.
2. Registered centre can nominate more users. However, the authorization must be from the centre's doctor in-charge.
3. All e-MOSS users need to complete a user agreement form and submit it to NRR for processing.

### Management of e-MOSS:

All patients registered with NRR shall be listed in the e-MOSS on the following day according to the criteria set in the e-MOSS. These are the listing where patients will be grouped:

1. SOS List
2. On Wait List
3. Auto Off List (Pending data update)
4. Temporary Off List
5. Pending Evaluation
6. Ineligible for transplant
7. Death and Transplanted

#### 1. SOS List:

Patients on this list are given specially priority as they are expected to have lifespan of less than a year unless renal transplantations are performed. Only nephrologists can request placement of patients into this list and patient will only be placed into this list after approval is obtained from the MOSS Committee.

## **2. On Wait List**

Patients listed here are patients who have met the criteria. These are the potential cadaver organ recipients.

## **3. Auto Off List (Pending data update)**

If the viral serology results of a patient who is in the 'On Wait List' are not updated after 6 months, the system will automatically place the patient into this list. The patient in this list will not be eligible for organ transplantation.

The patient will be placed back into the "On wait list" once the serology results have been updated and the patient will not be penalized.

## **4. Temporary Off List**

Doctor in charge should place the patient who is temporarily unfit for a transplant into this list so that he/she will not be contacted in the event of organ donation.

## **5. Pending Evaluation**

The potential eligible patients will be listed in the 'Pending List' upon register\ration with NRR. These patients' e-MOSS criteria have not been assessed by centre's doctor.

## **6. Ineligible for transplant**

System auto list those patients who do not meet e-MOSS criteria.

## **7. Death and Transplanted**

These are patients who had a transplant and the graft is still functioning and those patients who had passed away.



## PARTICIPATING HAEMODIALYSIS CENTRES

### JOHOR

1. Amitabha Haemodialysis Centre Johor Bahru
2. Batu Pahat Hospital
3. Batu Pahat Rotary
4. BP Renal Care (Batu Pahat)
5. BP Renal Care (Kluang)
6. BP Renal Care (Rengit)
7. BP Renal Care (Segamat)
8. BP Renalcare (Yong Peng)
9. Che Eng Khor Centre
10. Haemodialysis Mawar Gemas
11. Hospital Pakar Sultanah Fatimah Muar
12. JB Lions MAA-Medicare Charity Dialysis Centre (1)
13. JB Lions MAA-Medicare Charity Dialysis Centre (2)
14. JJ Lions Dialysis Centre
15. Johor Specialist Hospital
16. Kluang Hospital
17. Kota Tinggi Hospital
18. Mersing Hospital
19. Muar Dialysis
20. Muar Lions Renal Centre
21. Persatuan Membaiki Akhlak-Che Luan Khor\_NKF
22. Pertubuhan Hemodialisis Muhibbah (Labis)
23. Pertubuhan Hemodialisis Muhibbah (Segamat)
24. Pontian Hospital
25. Pontian Rotary Haemodialysis Centre
26. Premier Renal Care
27. Prima Dialysis Kluang
28. Pusat Dialisis & Kesihatan Masjid Bandar Baru Uda
29. Pusat Dialisis Nefro Utama (Kota Tinggi)
30. Pusat Dialisis Nefro Utama (Pontian)
31. Pusat Dialisis Perbadanan Islam (Pontian)
32. Pusat Dialisis Waqaf An-nur (Batu Pahat)
33. Pusat Dialisis Waqaf An-nur (Kota Raya)
34. Pusat Hemodialisis Darul Takzim
35. Pusat Hemodialisis Hidayah
36. Pusat Hemodialisis Rotary Kota Tinggi
37. Pusat Hemodialisis Rotary Kulai
38. Pusat Rawatan Perbadanan Islam (Kota Tinggi)
39. Puteri Specialist Hospital
40. Segamat Hospital
41. Sultan Ismail Hospital
42. Sultanah Aminah Hospital (Paed)
43. Sultanah Aminah Hospital
44. Systemic Dialysis Centre (1)
45. Systemic Dialysis Centre (2)
46. Tangkak Hospital
47. Temenggong Seri Maharaja Tun Ibrahim Hospital
48. The Rotary HD Centre (Johor Bahru)
49. Yayasan Pembangunan Keluarga Johor-NKF
50. Yayasan Rotary Kluang
51. Zhi En Dialysis Centre

### KEDAH

52. 807 Rumah Sakit Angkatan Tentera (Sg. Petani)
53. Baling Hospital
54. Buddhist Tzu Chi (Jitra)
55. Kuala Nerang Hospital
56. Kulim Haemodialysis (CS Tan)
57. Kulim Hospital
58. Langkawi Hospital
59. Metro Specialist Hospital
60. Pertubuhan Bakti Fo En Bandar Kulim
61. Pusat Dialisis K K Tan (Kulim)
62. Pusat Dialisis K K Tan (Sg Petani)
63. Pusat Haemodialisis Dr. Ismail
64. Pusat Hemodialisis Beng Siew
65. Pusat Hemodialisis Mergong
66. Pusat Hemodialisis Seroja
67. Pusat Kesihatan Jitra
68. Pusat Rawatan Hemodialisis Yayasan Emkay & Sultanah Bahiyah
69. Putra Medical Centre
70. Rawatan Dialisis Amal Lion\_NKF
71. Renal Care (Kedah)
72. Renal Medicare
73. Sik Hospital
74. Strand Specialist Hospital
75. Sultan Abdul Halim Hospital
76. Sultanah Bahiyah Hospital
77. Superkids Trinity-NKF Dialysis Centre
78. Yan Hospital

### KELANTAN

79. Gua Musang Hospital
80. KB Rotary-MAA Charity Dialysis
81. Kuala Krai Hospital
82. Machang Hospital
83. Nephrolife Haemodialysis Centre
84. Pakar Perdana Hospital
85. Pasir Mas Hospital
86. Pusat Dialisis Yayasan Buah Pinggang Kebangsaan (Kota Bharu)
87. Pusat Perubatan Tentera (Kota Bharu)
88. Pusat Rawatan Dialisis Islah (Kota Bharu)
89. Raja Perempuan Zainab II Hospital
90. Renal-Link (Kelantan)
91. Tanah Merah Hospital
92. Tengku Anis Hospital
93. Tumpat Hospital
94. Universiti Sains Malaysia Hospital

### MELAKA

95. 94 Hospital Angkatan Tentera (Terendak)
96. Alor Gajah Dialysis Centre
97. Alor Gajah Hospital

**MELAKA (con't)**

98. Amitabha Centre (Melaka)
99. Damai Medical & Heart Clinic
100. Mahkota Medical Centre
101. Melaka Hospital
102. Pantai Air Keroh Hospital
103. Pusat HD SJAM Bacang Melaka
104. Pusat Hemodialisis Suria (Jasin)
105. Sinar Hemodialisis
106. Tenang Haemodialysis Centre
107. Tenang Haemodialysis Jasin
108. Yakin Jaya
109. Yayasan Kebajikan The Southern Melaka

**NEGERI SEMBILAN**

110. Jelebu Hospital
111. Port Dickson Hospital
112. Pusat Hemodialisis Mawar N. Sembilan (Bahau)
113. Pusat Hemodialisis Mawar N. Sembilan (Lukut)
114. Pusat Hemodialisis Mawar N. Sembilan (Seremban)
115. Pusat Waqaf An -nur (Senawang)
116. Seremban Specialist Hospital
117. Tampin Hospital
118. Tuanku Ampuan Najihah Hospital
119. Tuanku Jaafar Hospital (Paed)
120. Tuanku Jaafar Hospital

**PAHANG**

121. Bentong Hospital
122. Jerantut Hospital
123. Kuala Lipis Hospital
124. Kuantan Clinical Diagnostic Centre
125. MAA-Medicare Charity (Mentakab)
126. Mentakab Haemodialysis Unit
127. Muadzam Shah Hospital
128. Pahang Buddhist Association
129. Pekan Hospital
130. Pusat Hemodialisis Islam Makmur
131. Raub Hospital
132. SJAM-KPS Haemodialysis Centre 9 (Raub)
133. Sultan Haji Ahmad Shah Hospital
134. Tengku Ampuan Afzan Hospital (Paed)
135. Tengku Ampuan Afzan Hospital
136. 96 Hospital Angkatan Tentera (Lumut)

**PERAK**

137. Batu Gajah Hospital
138. Berchaam Dialysis Centre
139. C.S. Loo Kidney & Medical Specialist
140. Changkat Melintang Hospital
141. Emnur Teguh
142. Gerik Hospital
143. Hope Haemodialysis Society Ipoh
144. Ipoh Hospital

145. Ipoh Hospital (Home)
146. Kampar Hospital
147. Kuala Kangsar Hospital
148. MAA-Medicare Charity (Teluk Intan)
149. Parit Buntar Hospital
150. Persatuan Amal Chin Malaysia Barat
151. Pertubuhan Perkhidmatan Haemodialisis Ar-Ridzuan
152. Pertubuhan Perkhidmatan Hemodialisis AIXIN Kerian
153. Pulau Pangkor Hospital
154. Pusat Dialisis Darul Iltizam Taiping
155. Pusat Dialisis Ehsan Perak
156. Pusat Dialisis Intan
157. Pusat Dialisis Kuala Kangsar
158. Pusat Dialisis Mutiara
159. Pusat Dialisis Penawar Permai
160. Pusat Dialisis Taiping (Kamunting)
161. Pusat Dialisis Taiping (Kuala Kangsar)
162. Pusat Dialisis Taiping (Parit Buntar)
163. Pusat Dialisis Taiping
164. Pusat Dialysis Setia
165. Pusat Hemodialisis Darul Iltizam (Ipoh)
166. Pusat Hemodialisis Kampar, Yayasan Nanyang
167. Pusat Hemodialisis Manjung
168. Renal Care (Ipoh Specialist)
169. Selama Hospital
170. Seri Manjung Hospital
171. Sg Siput Hospital
172. Taiping Hospital
173. Tanjung Malim Hospital
174. Tapah Hospital
175. Teluk Intan Hospital
176. Who Peng Cheang Seah
177. Yayasan Akhlak-NKF Taiping
178. Yayasan Dialysis Pendidikan Akhlak Perak-NKF Ipoh

**PERLIS**

179. Tuanku Fauziah Hospital
180. Tuanku Syed Putra Haemodialysis Centre

**PULAU PINANG**

181. AMD Rotary (Penang)
182. Asia Renal Care (Penang)
183. Balik Pulau Hospital
184. Buddhist Tzu Chi Dialysis Centre (Butterworth)
185. Buddhist Tzu Chi HD Centre (Penang)
186. Bukit Mertajam Hospital
187. Bukit Mertajam Specialist Hospital
188. Fo Yi NKF Dialysis Centre
189. Gleneagles Medical Centre
190. Island Hospital
191. K K Tan Specialist (BM)
192. Kepala Batas Hospital
193. Lam Wah Ee Hospital
194. Loh Guan Lye Specialist Centre
195. MAA-Medicare Charity (Butterworth)

**PULAU PINANG** (*con't*)

196. Pantai Mutiara Hospital
197. Penang Adventist Hospital
198. Penang Caring Dialysis Society
199. Penang Hospital
200. Penang Hospital (Home)
201. Penang Hospital (Paed)
202. Pertubuhan Dialisis Rotary-Satu Hati
203. Pertubuhan Hemodialisis SPS
204. Province Wellesley Renal Medifund
205. Pusat Haemodialisis Zakat Jawi
206. Pusat Haemodialisis St Anne BM
207. Pusat Hemodialisis Zakat (Balik Pulau)
208. Pusat Hemodialisis Zakat (Bukit Mertajam)
209. Pusat Hemodialisis Zakat (Butterworth)
210. PWRM (BM) Dialysis Centre
211. Renal Link (Penang)
212. Seberang Jaya Hospital (Butterworth)
213. Seberang Perai (Bagan)
214. Sungai Bakap
215. The Penang Community HD Society
216. TSC Renal Care

**SABAH**

217. Beaufort Hospital
218. Beluran Hospital
219. Duchess of Kent Hospital
220. Keningau Hospital
221. Kota Belud Hospital
222. Kota Kinabatangan Hospital
223. Kota Marudu Hospital
224. Kudat Hospital
225. Lahad Datu Hospital
226. Likas Hospital
227. MAA-Medicare Charity (Kota Kinabalu)
228. Nobel Dialysis Centre
229. Papar Hospital
230. Persatuan Buah Pinggang Sabah
231. Pusat Hemodialisis Palmcare Malaysia
232. Queen Elizabeth Hospital
233. Ranau Hospital
234. Rotary Tawau Tanjung
235. Sabah Medical Centre
236. Semporna Hospital
237. Sipitang Hospital
238. SJAM-KPS Pusat Hemodialisis Centre 10 (Bintulu)
239. Tambunan Hospital
240. Tawau Hospital
241. Tenom Hospital

**SARAWAK**

242. 801 Rumah Sakit Angkatan Tentera (Kuching)
243. Bau Hospital
244. Betong Hospital

245. Bintulu Hospital
246. CHKMUS-MAA Medicare Charity
247. Kanowit Hospital
248. Kapit Hospital
249. KAS-Rotary-NKF
250. Kuching Specialist Hospital
251. Lawas Hospital
252. Limbang Hospital
253. Lundu Hospital
254. Marudi Hospital
255. Miri Hospital
256. Miri Red Crescent Dialysis Centre
257. Mukah Hospital
258. Normah Medical Specialist Centre
259. Rejang Medical Centre
260. Saratok Hospital
261. Sarawak General Hospital
262. Sarikei Hospital
263. Serian Hospital
264. Sibu Hospital
265. Sibu Kidney Foundation
266. Simunjan Hospital
267. SJAM-KPS Haemodialysis Centre 8 (Sibu)
268. Sri Aman Hospital
269. Timberland Medical Centre

**SELANGOR**

270. 819 Rumah Sakit Angkatan Tentera
271. Ampang Hospital
272. Ampang Puteri Specialist Hospital
273. Apex Club of Klang-NKF Charity Dialysis Centre
274. Assunta Hospital
275. Bakti-NKF Dialysis Centre
276. Bangi Dialysis Centre
277. Banting Hospital
278. Berjaya NKF Dialysis Centre
279. Caring Dialysis Centre (Tanjong Karang)
280. Damansara Specialist Hospital
281. Haemodialysis Association Klang
282. Haemodialysis Edina
283. Healthcare Dialysis Centre
284. Hemodialisis Yayasan Veteran ATM
285. Kajang Dialysis Centre
286. Kajang Hospital
287. Kelana Jaya Medical Centre
288. Kuala Kubu Bharu Hospital
289. MAA-Medicare Charity (Kajang)
290. Persatuan Dialisis Kurnia PJ
291. PingRong-NKF
292. Pusat Dialisis Aiman (Shah Alam)
293. Pusat Dialisis Mesra (Kuala Selangor)
294. Pusat Dialisis Sijangkang
295. Pusat Dialisis Mesra (Kapar)
296. Pusat Dialisis Mesra KKB
297. Pusat Dialisis Putra Jaya (Semenyih)

## **SELANGOR** (*con't*)

298. Pusat Hemodialisis Fasa
299. Pusat Hemodialisis Kau Ong Yah Ampang
300. Pusat Hemodialisis Majlis Perbandaran Kelang
301. Pusat Hemodialisis Mawar N. Sembilan (Sepang)
302. Pusat Hemodialisis Mawar N. Sembilan (Seri Kembangan)
303. Pusat Perubatan Premier HUKM
304. Pusat Rawatan Dialisis Islah (Batu Caves)
305. Pusat Rawatan Hemodialisis Felina
306. Rawatan Dialisis Bukit Tinggi
307. Reddy Clinic
308. Renal Associates
309. S.P. Menon Dialysis Centre (Klang)
310. S.P. Menon Dialysis Centre (Petaling Jaya)
311. Selangor Medical Centre
312. Selayang Hospital
313. Serdang Hospital
314. SJAM-KPS Haemodialysis Centre 1 (Raja Muda Musa)
315. SJAM-KPS Haemodialysis Centre 11 (Shah Alam)
316. SJAM-KPS Haemodialysis Centre 2 (Klang)
317. SJAM-KPS Haemodialysis Centre 3 (Banting)
318. SJAM-KPS Haemodialysis Centre 5 (Rawang)
319. SJAM-KPS Haemodialysis Centre 6 (Kuala Selangor)
320. Smartcare Dialysis Centre (Subang Jaya)
321. Sri Kota Medical Centre
322. Subang Jaya Medical Centre
323. Sungai Buloh Hospital
324. Sunway Medical Centre (1)
325. Sunway Medical Centre (2)
326. Syukur Elit Sdn Bhd
327. Tanjung Karang Hospital
328. Tengku Ampuan Jemaah Hospital
329. Tengku Ampuan Rahimah Hospital
330. Universiti Kebangsaan Malaysia Bangi
331. Yayasan Kebajikan SSL (Puchong)
332. Yayasan Kebajikan SSL (Petaling Jaya)
347. Kuala Lumpur Hospital (Home)
348. Kuala Lumpur Hospital (Paed.)
349. Kuala Lumpur Hospital (Unit 1)
350. Kuala Lumpur Hospital (Unit 3)
351. Kuala Lumpur Hospital (Unit 4)
352. Kuala Lumpur Lions Renal Centre
353. Lifeline Dialysis Clinic
354. MAA-Medicare Charity (Cheras)
355. MAA-Medicare Charity (Kuala Lumpur)
356. National Kidney Foundation Dialysis Centre (Kuala Lumpur)
357. Pantai Indah Hospital
358. Pantai Medical Centre (1)
359. Pantai Medical Centre (2)
360. Poliklinik Komuniti Tanglin
361. Pusat Dialisis Falah
362. Pusat Dialisis Pusat Punggutuan Zakat
363. Pusat Hemodialisis Dato' Lee Kok Chee
364. Pusat Hemodialisis Harmoni
365. Pusat Hemodialisis PUSRAWI
366. Pusat Hemodialisis Waz Lian
367. Pusat Hemodialisis Yayasan Felda
368. Pusat Pakar Tawakal
369. Pusat Rawatan Dialisis Nefro Utama (Setapak)
370. Rawatan Haemodialisis Koswip
371. Renal Dialysis Centre
372. Renal Healthcare
373. Renal-Link Sentosa (Sentosa Hospital)
374. Rotary Damansara-NKF Dialysis
375. S.P. Menon Dialysis Centre (Kuala Lumpur)
376. Smartcare Dialysis Clinic (Cheras)
377. The Kidney Dialysis Centre (Jalan Kelang Lama)
378. The Kidney Dialysis Centre (Jalan Ipoh)
379. The Nayang-NKF Dialysis Centre
380. Tung Shin Hospital & Yayasan Nanyang Press
381. Tung Shin Hospital
382. Universiti Kebangsaan Malaysia Hospital
383. University Malaya Medical Centre
384. University Malaya Specialist Centre
385. Putrajaya Hospital

## **TERENGGANU**

333. Besut Hospital
334. Dungun Hospital
335. Hulu Terengganu Hospital
336. Kemaman Hospital
337. Pusat Dialisis Epic
338. Pusat Dialisis Terengganu / NKF
339. Pusat Hemodialisis Nabilah
340. Pusat Rawatan Dialisis Islah (Kuala Terengganu)
341. Sultanah Nur Zahirah Hospital

## **WILAYAH PERSEKUTUAN**

342. Labuan Hospital
343. Aiman Dialysis Centre
344. Charis-NKF Dialysis Centre
345. Cheras Dialysis Centre
346. Kg Baru Medical Centre

## PARTICIPATING PERITONEAL DIALYSIS CENTRES

<b>Centre Name</b>	<b>State</b>
1. BP Renal Care	Johor
2. Sultanah Aminah Hospital (Paed)	Johor
3. Sultanah Aminah Hospital	Johor
4. Sultanah Bahiyah Hospital	Kedah
5. Raja Perempuan Zainab II Hospital	Kelantan
6. Universiti Sains Malaysia Hospital	Kelantan
7. Damai Medical & Heart Clinic	Melaka
8. Melaka Hospital	Melaka
9. Tuanku Jaafar Hospital (Paed)	Negeri Sembilan
10. Tuanku Jaafar Hospital	Negeri Sembilan
11. Tengku Ampuan Afzan Hospital	Pahang
12. 96 Hospital Angkatan Tentera (Lumut)	Perak
13. Ipoh Hospital	Perak
14. Penang Hospital (Paed)	P. Pinang
15. Penang Hospital	P. Pinang
16. Queen Elizabeth Hospital	Sabah
17. Sabah Medical Centre	Sabah
18. Sarawak General Hospital	Sarawak
19. Selayang Hospital	Selangor
20. Serdang Hospital	Selangor
21. Tengku Ampuan Rahimah Hospital	Selangor
22. Sultanah Nur Zahirah Hospital	Terengganu
23. Kuala Lumpur Hospital (Paed.)	W. P. Kuala Lumpur
24. Kuala Lumpur Hospital	W. P. Kuala Lumpur
25. Universiti Kebangsaan Malaysia Hospital	W. P. Kuala Lumpur
26. University Malaya Medical Centre	W. P. Kuala Lumpur

## PARTICIPATING TRANSPLANT FOLLOW-UP CENTRES

Centre Name	State
1. Batu Pahat Hospital	Johor
2. Hospital Sultan Ismail Pandan	Johor
3. Hospital Sultanah Aminah (Paed)	Johor
4. Kluang Hospital	Johor
5. Pakar Sultanah Fatimah Muar Hospital	Johor
6. Pontian Hospital	Johor
7. Segamat Hospital	Johor
8. Sultanah Aminah Hospital	Johor
9. Alor Setar Hospital	Kedah
10. Kota Bharu Hospital	Kelantan
11. Universiti Sains Malaysia Hospital	Kelantan
12. Damai Medical & Heart Clinic	Melaka
13. Mahkota Medical Centre	Melaka
14. Melaka Hospital	Melaka
15. Seremban Hospital	Negeri Sembilan
16. Tg. Ampuan Afzan Hospital	Pahang
17. Ipoh Hospital	Perak
18. Taiping Hospital	Perak
19. Pulau Pinang Hospital	P. Pinang
20. Duchess of Kent Hospital	Sabah
21. Queen Elizabeth Hospital	Sabah
22. Sabah Medical Centre	Sabah
23. Tawau Hospital	Sabah
24. Bintulu Hospital	Sarawak
25. Miri Hospital	Sarawak
26. Sarawak General Hospital	Sarawak
27. Sibu Hospital	Sarawak
28. Timberland Medical Centre	Sarawak
29. Ampang Puteri Specialist Hospital	Selangor
30. Selangor Medical Centre	Selangor
31. Selayang Hospital	Selangor
32. Serdang Hospital	Selangor
33. Subang Jaya Medical Centre	Selangor
34. Sunway Medical Centre	Selangor
35. Tan Medical Renal Clinic	Selangor
36. Tg. Ampuan Rahimah Hospital	Selangor
37. Kemaman Hospital	Terengganu
38. Kuala Terengganu Hospital	Terengganu
39. Kuala Lumpur Hospital	W. P. Kuala Lumpur
40. Kuala Lumpur Hospital (Paed)	W. P. Kuala Lumpur
41. Renal Dialysis Centre	W. P. Kuala Lumpur
42. Universiti Kebangsaan Malaysia Hospital	W. P. Kuala Lumpur
43. University Malaya Medical Centre	W. P. Kuala Lumpur

## CONTRIBUTING EDITORS

Chapter	Title	Editors	Institutions
1	All Renal Replacement Therapy in Malaysia	Lim Teck Onn Lim Yam Ngo	Clinical Research Centre, HKL Kuala Lumpur Hospital
2	Dialysis in Malaysia	Lim Teck Onn Lim Yam Ngo Lee Day Guat	Clinical Research Centre, HKL Kuala Lumpur Hospital Kuala Lumpur Hospital
3	Death & Survival on Dialysis	Wong Hin Seng Ong Loke Meng Wan Shaariah Md Yusuf	Selayang Hospital Penang Hospital Tuanku Jaafar Hospital
4	Quality of Life & Rehabilitation Outcomes	Liu Wen Jiun Chew Thian Fook Alinda Chiu Sze Fung Zaki Morad B Mohd Zaher	Sultanah Aminah Hospital Tuanku Jaafar Hospital University Putra Malaysia International Medical University
5	Paediatric Renal Replacement Therapy	Lee Ming Lee Lynster Liaw Susan Pee Wan Jazilah Wan Ismail Lim Yam Ngo	Tuanku Jaafar Hospital Penang Hospital Sultan Ismail Hospital Selayang Hospital Kuala Lumpur Hospital
6	Management of Anaemia in Dialysis Patients	Philip N. Jeremiah Bee Boon Cheak	Ampang Puteri Specialist Hospital Selayang Hospital
7	Nutrition Status on Dialysis	Ahmad Fauzi Abdul Rahman Tilakavati Karupaiah Winnie Chee Siew Swee	Puteri Specialist Hospital Faculty of Allied Health Sciences, UKM Faculty of Allied Health Sciences, UKM
8	Blood Pressure Control and Dyslipidemia	Prasad Menon Lee Wan Tin	Subang Jaya Medical Centre Subang Jaya Medical Centre
9	Management of Renal Bone Disease in Dialysis Patients	Fan Kin Sing Rozina Bt Ghazalli Ching Chen Hua Liew Yew Fong	Gleneagle Intan Medical Centre Penang Hospital Sultanah Bahiyah Hospital Penang Hospital
10	Hepatitis on Dialysis	Teo Sue Mei Claire Tan Hui Hong Foo Sui Mei	Ipoh Hospital Sarawak Hospital Ipoh Hospital
11	Haemodialysis Practices	Tan Chwee Choon Shahnaz Shah Firdaus Khan Rafidah Abdullah Norleen Bt Zulkarnain Sim	Tengku Ampuan Rahimah Hospital Tengku Ampuan Rahimah Hospital Selayang Hospital Tengku Ampuan Rahimah Hospital
12	Chronic Peritoneal Dialysis Practices	Sunita Bavanandan Lily Mushahar	Kuala Lumpur Hospital Kuala Lumpur Hospital
13	Renal Transplant	Goh Bak Leong Zaki Morad B Mohd Zaher Fan Kin Sing Lily Mushahar Rohan Malek Prasad Menon Tan Si Yen	Serdang Hospital International Medical University Gleneagle Intan Medical Centre Kuala Lumpur Hospital Selayang Hospital Subang Jaya Medical Centre University Malaya Medical Centre

## FOREWORD

The Renal Replacement Therapy program in the country continues to grow and we achieved a treatment rate of 118 per million population in 2006. There were nearly 15,000 patients on dialysis at the end 2006. The growth has, as in previous years, been contributed by the combined efforts of the three provider groups – public, non-governmental and private sectors. This success is something we are justifiably proud of. It has attracted the attention of countries which faced similar challenges who want us to share our experience. Nonetheless a number of challenges identified in the previous reports remain. There is still the problem of equity in dialysis provision. Treatment rates have improved in states which were underprovided over the last few years. However the gap between these states and the economically developed ones remains. There is a lack of centres run by NGOs to complement the efforts of the Ministry of Health in the states with low provision rates. It would appear that charitable organizations that fund NGO dialysis centres flourish in areas with higher income and quite rightly so as they depend on population in the area for support.

Last year saw the implementation of the Regulations on Hemodialysis centres of the Private Healthcare Facilities Act. These regulations are meant to ensure that dialysis centres meet the minimum standards which are enforceable by law. It is a welcomed move and officers in the relevant department of the Ministry visited dialysis centres to ensure regulations in the act were enforced. While many may argue that certain provisions of the regulations need revision, the mere fact that a minimum set of standards can be enforced is a big and laudable step in the care of dialysis patients. But nephrologists and all others interested in the care of ESRD patients should set standards of care beyond that of the Act. Data from this report showed that we have done well in most aspects of dialysis practice. Death rate for Hemodialysis patients has remained unchanged over the last 10 years despite more older and diabetic patients being accepted for treatment. There is still considerable variation amongst centres in various parameters that are monitored by the registry. We should set targets for various aspects of dialysis practice that are consistent with those advocated by the international guidelines and work on minimising the variations.

The Registry in its 15th year of existence has collected enormous amount of data that has been useful to various people not the least the practising nephrologists. It has introduced innovations including the “centre report card” where individual centres can gauge its performance against the national average. The registry should now consider collecting data on the cost of dialysis care. The country spends hundreds of millions of ringgit on dialysis and it will help the government as well as the practitioners to have accurate data on the financing of the dialysis program.

The 14th report also shows an alarming trend in the incidence of diabetic nephropathy as a cause of ESRD. Fifty seven percent of new patients accepted for dialysis last year were diabetics. We undoubtedly have the dubious honour of being the number one country in the world when it comes to diabetes as a cause of ESRD. We should consider doing a more detailed study to find whether diabetes is the real cause of ESRD in these patients or present as a co-morbid illness in a patient with some other cause of ESRD. The current method of data collection does not distinguish diabetes as cause or a co-morbid illness.

Renal transplantation continues to stagnate in the country as evidenced by this and the previous years reports. There has been an attempt at revitalizing transplantation including the formulation of a National Organ and Tissue Transplantation policy, the proposed setting up of a Transplantation unit in the Ministry of health to catalyse the Transplantation process and the creation of a budget specific for Transplantation. Nephrologists must play a more active role to promote transplantation. The clamp down by the Chinese authorities on commercial cadaveric transplantation in hospitals in China should be taken as an opportunity to promote live related kidney transplantation.

Finally we thank all those who contributed to the success of this report - the indefatigable Ms Lee Day Guat and her staff, Chapter editors and of course the Report editors Drs Lim Yam Ngo and Lim Teck Onn whose untiring efforts at ensuring an accurate and readable document shows through in this 14th report.

Dr. Rozina Ghazalli  
Chairperson, National Renal Registry



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## REPORT SUMMARY

- Intake of new dialysis patients showed a linear increase over the years -from 1136 in 1997 to 3152 in 2006 with corresponding treatment rates of 52 and 118 per million population.
- Prevalent dialysis patients increased from 3698 (171 per million) in 1997 to almost 15000 (550 per million) at year end 2006.
- Transplant rates remain at about 5-7 per million. Patients with functioning renal transplants increased from 1083 (50 per million) to 1725 (65 per million) over the same period.
- Dialysis treatment rates varied from about 56-104 per million state population in the economically underdeveloped states to >140 per million in the more economically advantaged states in 2006.
- From the centre survey carried out at the end of 2006, there were a total of 14946 dialysis patients, 33.7% in MOH centres, 31.1% in non-governmental organizations (NGO) centres and 32.8% in private sector. Almost all patients in NGO and private centres were on centre HD. In MOH, 24% were on chronic PD. HD capacity to patient ratio showed slight reduction in 2006 with the lowest in Kelantan and Terengganu.
- The treatment gap between men and women has remained consistent over the years.
- Dialysis treatment rates for those < 55 years of age had leveled while those >55 years continued to increase. 53% of new dialysis patients were at least 55 years old
- At least 87% of new patients were accepted into centre haemodialysis
- The government continued to fund about 53% of dialysis treatment, NGO funding was 14% in 2006, and self funding had decreased to 27%.
- Proportion of new ESRD patients due to diabetes mellitus increased further to 57% in 2006, followed by hypertension at 6%.
- The annual death rate for those on hemodialysis remained relatively unchanged while the annual death rate on CAPD showed a 15% reduction over the last 10 years.
- Cardiovascular disease and death at home remained the commonest cause of death in 2006 at 28 and 21% respectively; sepsis was third at 13%.
- The overall unadjusted 5 years and 10 years patient survival on dialysis were 57% and 35% respectively. HD patient survival was superior to those on CAPD even after adjusting for age and diabetes. There was wide centre variation with regards to HD patient survival at one year which was more apparent at 5 years. Adjusted patient survival varied widely between CAPD centres at 5-years but not at 1-year.
- Older and diabetic patients had poorer survival on dialysis.
- After adjustment for multiple risk factors, younger patients, lower diastolic BP, lower calcium and phosphate were associated with lower mortality. Low serum albumin, Kt/V, haemoglobin and calcium phosphate product were associated with higher mortality.
- Median QoL index scores on dialysis were satisfactory and HD patients achieved a lower score than CAPD patients. Diabetes Mellitus and older age group were associated with lower median QoL index scores. Higher employment rate amongst HD and CAPD patients who started dialysis earlier
- In 2006, 84% of HD and 74% of CAPD patients were on erythropoietin (EPO). Blood transfusion rate in dialysis patients increase to 18% in 2006. Use of IV Iron has increased. The median weekly EPO dose has increased to 8000 units, in both HD and CAPD patients. Median haemoglobin level increased to 10.5g/L in 2006. Variations were seen in the use of EPO, blood transfusion rates, measures of iron stores and hemoglobin levels in HD and CAPD centres

## REPORT SUMMARY (*con't*)

- Serum albumin levels remained at mean and median of about 40g/L for HD and about 33.5g/L in CAPD patients in 2006. There were wide variations in the proportion of patients with serum albumin >40g/L in both HD and CAPD centres.
- BMI for HD patients has stabilized around 24, but was still increasing for patients on CAPD patients improved. There was some variation in proportion of patients with BMI  $\geq$  18.5 in both HD and PD centres.
- In 2006, there was a trend noted towards increasing predialysis systolic but not diastolic BP in HD patients. BP control in CAPD patients improved slightly over the years. The variation noted among the various HD and PD centres in median systolic or diastolic BP was not wide but there was wide variation in the proportion of patients achieving BP of <140/90 mmHg. BP control in CAPD was much better than in haemodialysis patients
- Improving cholesterol levels were seen in both HD and CAPD patients with lower levels seen in HD patients. Serum triglyceride levels did not show much change over the years and was lower in HD patients. There was some variation in lipid control between dialysis centres.
- In 2006 calcium carbonate remained the major phosphate binder in both HD and CAPD patients. Phosphate control was better in CAPD patients. The target of calcium phosphate product of less than 4.5 mmol<sup>2</sup>/L<sup>2</sup> was achieved more by CAPD patients than HD. Mean iPTH levels was about 220 ng/ml for both HD and CAPD patients in 2006. There was wide variation in serum calcium, phosphate, calcium phosphate product and iPTH among both hemodialysis and CAPD centres.
- The prevalence of Hepatitis B infection has remained unchanged over the years, and was quite similar between HD and CAPD patients. HCV prevalence showed a declining trend to a median of 8% in 2006. The proportion of HCV infected patients varied widely between HD centers. Previous renal transplant and history of blood transfusion were associated with a significantly higher risk of HCV seroconversion Completely assisted HD patients had a significantly lower risk of acquiring HCV infection
- Haemodialysis practices: There was increased use of brachiocephalic fistulae, higher blood flow rates, increased usage of synthetic membranes, increased number of reuse and almost universal use of bicarbonate buffer. Although the prescribed median KT/V was 1.6 in 2006, the delivered median KT/V was only 1.4. The percentage of patients with a delivered KT/V > 1.2 and KT/V > 1.3 was 82% and 66% respectively. In 2006, the median urea reduction ratio was 71.9% and the percentage of patients with URR > 65% was 79%. There was wide variation in the proportion of patients with blood flow rates of >250 ml/min, prescribed KT/V of >1.3 and delivered KT/V of >1.2 but less variation in urea reduction ratio among HD centres. Technique survival was better in HD compared to PD, in the younger age groups and the non-diabetics but was not related to the year of starting dialysis.
- Chronic PD practices - In 2006, CAPD remained the commonest mode of PD at 90% but APD use increased to 6%. 92% were on the Baxter disconnect system. 91% were on 4 exchanges a day, 82% used a fill volume of 2 L. The median delivered weekly Kt/V was 2.1, 59% achieved target Kt/V of >2.0 with a 3-fold variation between the highest- and the lowest-performing centres. Technique survival was better for younger patients and non-diabetics but was not related to the year of starting dialysis or gender. Commonest cause of technique failure was peritonitis and membrane failure.
- In 2006, median peritonitis rate was 33 patient-months but varied between 16 and 103 patient-months/episode among centres. Gram positive and Gram negative organisms each accounted for 32% and 22% of peritonitis episodes.



## REPORT SUMMARY (*con't*)

### Renal Transplantation

- There were 161 new renal transplant recipients in 2005 and 1725 with functioning transplants at the end of 2006.
- Mean age of new transplant patients in 2006 was 37 years; 68% were male, 21% diabetic, 7% HbsAg positive and 7% anti-HCV positive at the time of transplantation.
- Commonest known primary renal disease was chronic glomerulonephritis followed by hypertension and diabetes mellitus.
- In 2006, commercial transplants from China constituted 57% of all new renal transplantation, live donor transplantation 21% and local cadaveric transplants contributed only 19%.
- 76% of renal transplant recipients were on cyclosporine, 97% on prednisolone, and 17% were on tacrolimus. 48% were on MMF and 33% on azathioprine
- 34% of the prevalent renal transplant recipients had diabetes mellitus before transplantation, another 8% developed diabetes mellitus post transplantation
- In 2006, 49 (3%) of transplant recipients died and 30 (2%) lost their grafts. Infection, cardiovascular disease and death at home were the commonest causes of death for the last decade and accounted for 41%, 19% and 13% respectively. Renal allograft rejection accounted for 50-78% of graft losses for the last 10 years
- The overall transplant patient survival rate from 1993 to 2006 was 95%, 91%, 88% and 80% at 1 year, 3 years, 5 years and 10 years respectively, while the overall graft survival rate was 92%, 85%, 79% and 63% respectively. Living donor and commercial cadaver grafts had the best patient and graft survival rates.
- In 2006, 85.5% of recipients were hypertensive, 22.9% had diabetes and 57.1% had renal insufficiency fulfilling the criteria for CKD III and above, 13.1% were obese with BMI above 30.

### Paediatric Renal Replacement Therapy

- Intake of new paediatric dialysis patients increased from 41 in 1997 to 88 in 2006 giving a dialysis acceptance rate of 4 per million age related population (pmarp) to 8 pmarp respectively.
- New renal transplant rate was 2 pmarp in 2005 and 2006.
- At the end of 2006 there were a total of 468 patients under 20 on dialysis giving a dialysis prevalence rate 42 pmarp.
- The number of patients with functioning transplants in 2006 was 139 giving a prevalence rate of 12 pmarp.
- Dialysis treatment rates were higher in the economically advantaged states of Malaysia.
- The number of 0-4 year olds provided RRT remained very low.
- Chronic PD was the initial dialysis modality in about 50% of patients. Of this 10-20% were on automated PD..
- About 90% received dialysis in government centres.
- Glomerulonephritis accounted for 24% of ESRD, focal segmental glomerulosclerosis 10%, and SLE 8%. 39% of patients had unknown primary renal disease.
- Patient survival for HD was 95% at 1 year, 84% at 5 years. CAPD patient survival was 95% at 1 year and 79% at 5 years.
- In the last 10 years, live related transplantation constituted slightly more than 50%, and cadaveric transplantation a quarter with another quarter from overseas cadaveric transplantation.
- Transplant patient survival was 98% at 1 year and 94% at 5 years; graft survival was 89% at 1 year and 81% at 5 years.

## ABBREVIATIONS

APD	Automated peritoneal dialysis
CAPD	Continuous ambulatory peritoneal dialysis
CCPD	Continuous cycling peritoneal dialysis
CKD	Chronic Kidney Disease
CRC	Clinical Research Centre
ESRD	End Stage Renal Disease
HD	Haemodialysis
JNC IV	Joint National Council IV
MOH	Ministry of Health
MOSS	Malaysian Organ Sharing System
NGO	Non-governmental organization
NRR	National Renal Registry
PD	Peritoneal dialysis
pmarp	Per million age related population
pmp	Per million population
PTDM	Post transplant diabetes mellitus
RRT	Renal replacement therapy
SDP	Source data producer
TX	Transplant

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