

Chapter 3: Economics of Dialysis

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16th Report of the Malaysian Dialysis and Transplant Registry 2008

Table 3.1: Trends in Malaysian GDP, population health and dialysis provision, 1980-2005

| | 1980 | 1990 | 2000 | 2005 |
|----------------------------------|------|-------|-------|-------|
| GDP per capita (in 2005RM) | 8114 | 10049 | 16914 | 19057 |
| Life expectancy at birth (years) | 66.9 | 70.3 | 72.6 | 73.7 |
| Under 5 mortality (per 1,000) | 42 | 22 | 14 | 12 |
| Urban population (% of total) | 42 | 49.8 | 61.8 | 67.3 |
| Treated RRT incidence | 4 | 20 | 84 | 123 |
| Treated RRT prevalence | 8 | 71 | 338 | 574 |

Data sources: International Monetary Fund World Economic Outlook Database, World Bank HNP Stats, Malaysian National Renal Registry.

Table 3.2: Prevalence of renal replacement therapy (RRT), dialysis and renal transplant among various regions in the world [2] and by Countries' per capita Gross National Income (GNI) according to World Bank classification [3]

| AARegion/ Country | Prevalence rate in per million population | | |
|---|---|----------|------------|
| | RRT | Dialysis | Transplant |
| North America | 1505 | 1030 | 470 |
| Europe | 585 | 400 | 185 |
| Japan | 2045 | 1945 | 100 |
| Asia (excluding Japan) | 70 | 60 | 10 |
| Latin America | 380 | 320 | 65 |
| Africa | 70 | 65 | 5 |
| Middle East | 190 | 140 | 55 |
| Malaysia (GNI USD5070) | 574 | 512 | 64 |
| High income countries (GNI>USD 9386) | 748 | - | - |
| Upper middle income countries (GNI USD3036- 9385) | 360 | - | - |
| Lower middle income countries (GNI USD766- 3035) | 120 | - | - |
| Low income countries (GNI< USD 766) | 37 | - | - |

Data Sources: Grassmann A, Gioberge S, Moeller S et al. ESRD patients in 2004: global overview of patient numbers, treatment modalities and associated trends. *Nephrol Dial Transplant* 2005; 20: 2587–2593
 White SL, Chadban SJ, Jan S, Chapman JR, Cass A. How can we achieve global equity in provision of renal replacement therapy? *Bull World Health Organ.* 2008;86:229-37

Figure 3.2(a) Prevalence of renal replacement therapy (RRT) among various regions in the world 2005 and by countries' per capita GNI according to World Bank classification

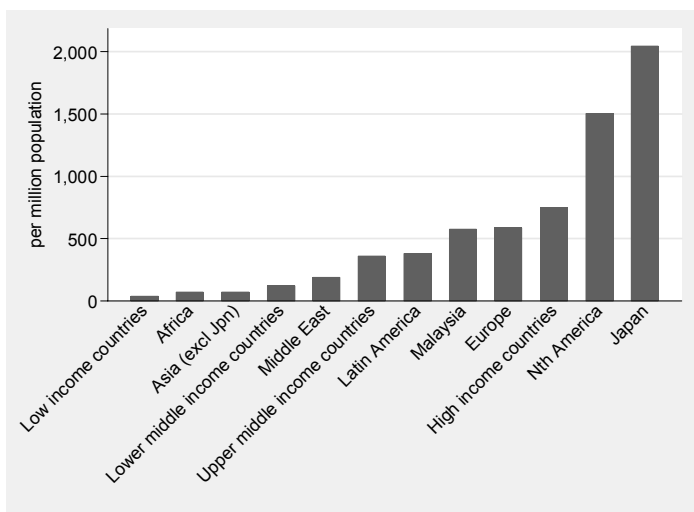
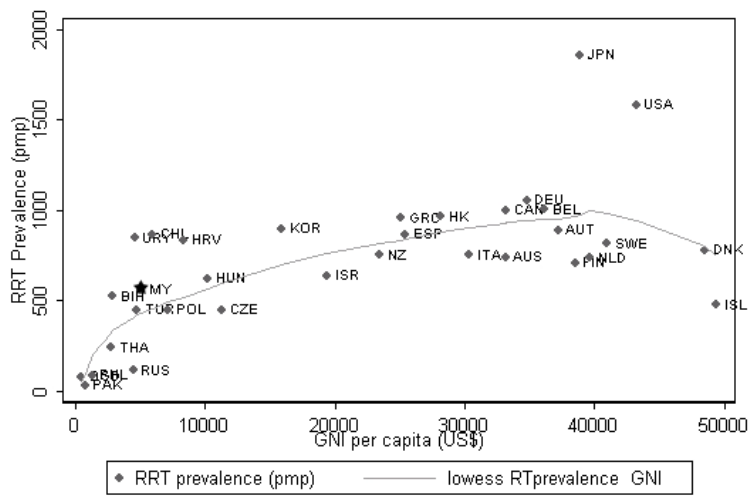
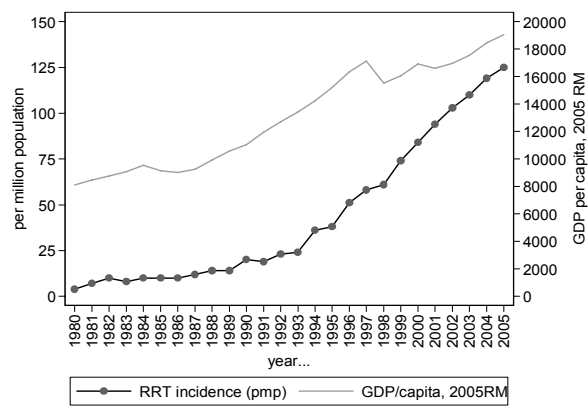


Figure 3.2(b): International comparison of income & RRT treatment prevalence, 2005



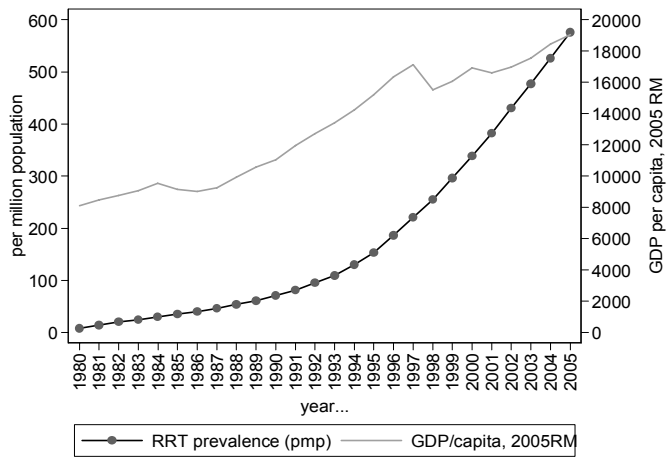
Data: USRDS Annual Data Report 2007, World Bank World Development Indicators

Figure 3.1(a): Dialysis incidence and GDP per capita, 1980-2005



Data sources: International Monetary Fund World Economic Outlook Database, Malaysian National Renal Registry.

Figure 3.1(b): Dialysis prevalence and GDP per capita, 1980-2005



Data: International Monetary Fund World Economic Outlook Database, Malaysian National Renal Registry

Table 3.3: Trends in dialysis funding and provider mix

| | 1990 | 1995 | 2000 | 2005 |
|--|------|------|-------|-------|
| Dialysis incidence | 13 | 33 | 78 | 119 |
| Dialysis prevalence | 44 | 108 | 285 | 512 |
| Sectoral share of provision (%) | | | | |
| % Public | 88 | 65 | 43 | 37 |
| % NGO | 5 | 20 | 34 | 32 |
| % Private | 7 | 15 | 23 | 30 |
| Funding for dialysis (2005 RM million) | | | | |
| Public | 15.4 | 39.4 | 92.2 | 255.2 |
| Charity | 0.6 | 5.3 | 29.2 | 45.3 |
| Private | 7.9 | 25.5 | 81.0 | 78.6 |
| Total | 23.9 | 70.2 | 202.4 | 379.1 |
| Funding for dialysis (%) | | | | |
| % Public | 64 | 56 | 46 | 67 |
| % Charity | 3 | 8 | 14 | 12 |
| % Private | 33 | 36 | 41 | 21 |

Note on total cost: expenditure estimate based on private sector inflation adjusted HD prices from 1990 to 2005 and govt HD/CAPD inflation adjusted costs in 1996 & 2001.

Figure 3.3(a): Dialysis funding by sector, 1990-2005 (RM million)

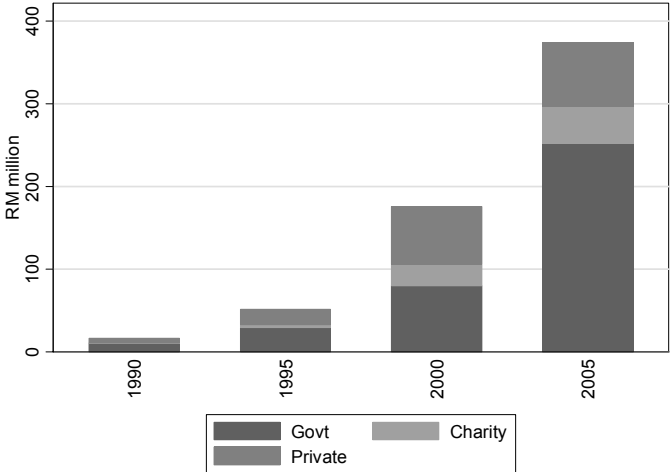


Figure 3.3(b): Dialysis funding by sector, 1990-2005 (%)

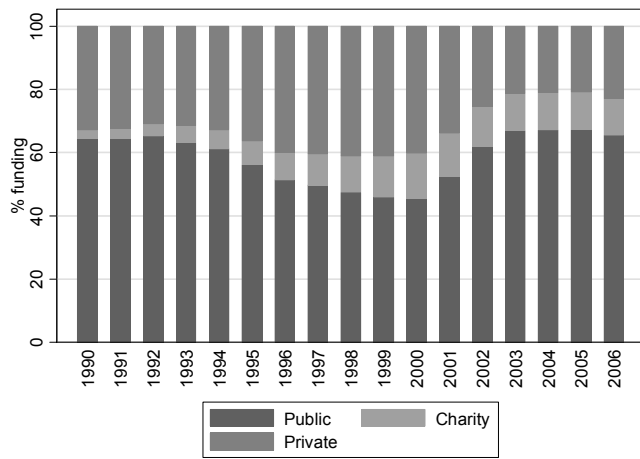


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Table 3.4: Trends in resource generation for dialysis treatment 1990-2005

| | 1990 | | 1995 | | 2000 | | 2005 | |
|---|------|-------|------|-------|------|-------|------|-------|
| Resource generation for Dialysis | | | | | | | | |
| Trained nephrologists, No. | 5 | | 8 | | 33 | | 89 | |
| Trained dialysis nurses and medical assistants [^] , number per year (%) | | | | | | | | |
| Public | 32 | | 15 | | 96 | | 124 | (89) |
| Private | | | | | | | 16 | (11) |
| Total | 32 | (100) | 15 | (100) | 96 | (100) | 140 | (100) |
| HD facilities by sector, No. (%) | | | | | | | | |
| Public | 22 | (9) | 30 | (42) | 56 | (35) | 153 | (39) |
| NGO | 0 | (0) | 12 | (17) | 51 | (32) | 99 | (25) |
| Private | 15 | (41) | 30 | (42) | 54 | (34) | 144 | (36) |
| Total | 37 | (100) | 72 | (100) | 161 | (100) | 396 | (100) |
| HD machine by sector, No. (%) | | | | | | | | |
| Public | | | | | 664 | (30) | 1142 | (29) |
| NGO | | | | | 830 | (37) | 1427 | (37) |
| Private | | | | | 750 | (33) | 1317 | (34) |
| Total | | | | | 2244 | (100) | 3886 | (100) |

[^]Trained by Ministry of Health and National Kidney Foundation.

Figure 3.4(a): Dialysis human resources, 1990-2005

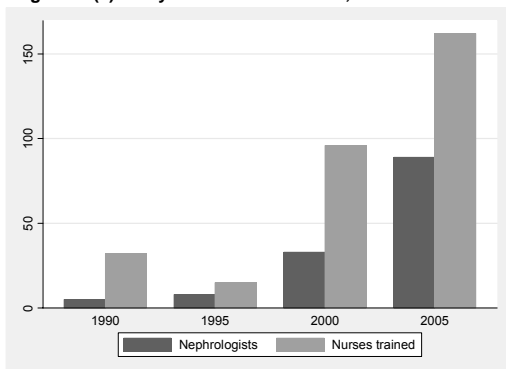


Figure 3.4(b): Haemodialysis centres by sector, 1990-2005

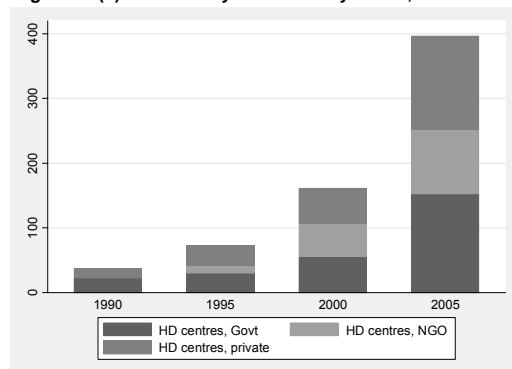


Figure 3.4(c): HD machines by sector, 2000-2005

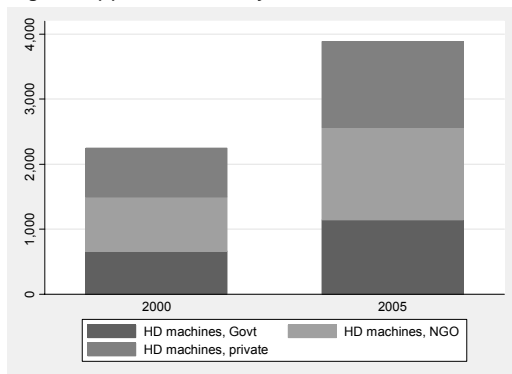


Table 3.5: Trends in dialysis market prices

| | 1990 | 1995 | 2000 | 2005 |
|---|------|------|-------|-------|
| Dialysis prevalence | 44 | 108 | 285 | 512 |
| Price per HD (current RM) | 170c | 159d | 163e | 168f |
| Price per HD (2005RM) | 286c | 225d | 191e | 168f |
| Average Household monthly income (2005RM) | 1963 | 2855 | 3012a | 3356b |
| HD cost to monthly HH income (%) | 186 | 103 | 83 | 65 |

Note: a1999, b2004, c1992-5, d1996-9, e2000-2, f2003-5

Data: Private sector HD prices were from a 2007 survey of 12 private HD centres in Peninsular Malaysia, Malaysia Plan reports

Figure 3.5(a): Trends in dialysis cost-efficiency (HD price in 2005 RM)

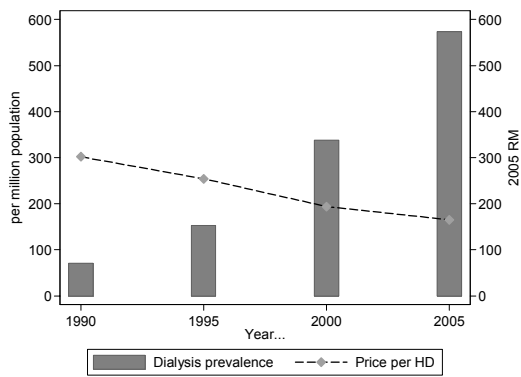


Figure 3.5(b): Trends in dialysis cost-efficiency (HD price as % of household income)

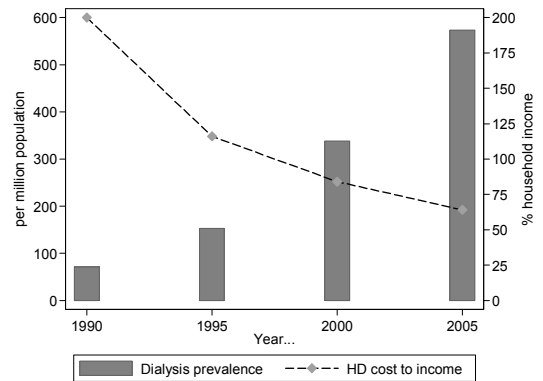


Figure 3.5(c): Trends in dialysis costs: Actual and assuming no efficiency gained

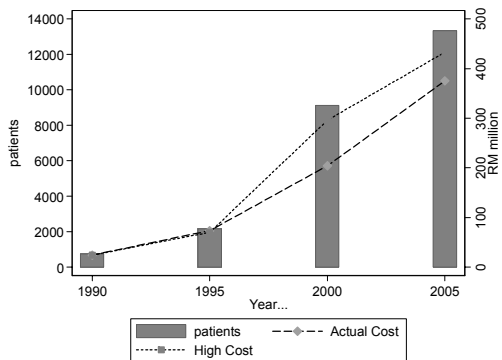


Table 3.6: International comparison of dialysis cost efficiency, 2005

| | M'sia | US | UK | Aust |
|---|-------|------|------|------|
| Dialysis incidence | 119 | 294 | 89 | 81 |
| Dialysis prevalence | 512 | 1105 | 375 | 424 |
| Price per HD (2005RM/US\$/£/A\$) | 168 | 150 | 168 | 163 |
| Mean Household monthly income (2005RM/US\$/£/A\$) | 3356 | 5279 | 2732 | 5670 |
| HD cost* to monthly HH income (%) | 65% | 37% | 80% | 37% |

Note: *assuming 13 HD procedures per month

Table 3.8 Geographic distribution of dialysis Treatment in Malaysia, 1990-2005

| | 1990 | 1995 | 2000 | 2005 |
|---------------------|------|------|-------|------|
| Dialysis prevalence | 44 | 108 | 285 | 512 |
| Johor | 30.4 | 114 | 395.3 | 689 |
| Kedah & Perlis | 20.8 | 69.8 | 226.1 | 453 |
| Kelantan | 12.6 | 31.2 | 102.8 | 285 |
| Melaka | 43.1 | 182 | 420.7 | 773 |
| Negeri Sembilan | 35 | 129 | 336 | 595 |
| Pahang | 26.6 | 68.9 | 195.2 | 326 |
| Perak | 53.7 | 124 | 349 | 631 |
| Penang | 50.1 | 149 | 442 | 814 |
| Sabah | 14 | 34.7 | 95.5 | 172 |
| Sarawak | 45 | 74.8 | 201.8 | 365 |
| Selangor & WP | 97.7 | 191 | 373.8 | 632 |
| Trengganu | 14 | 46.6 | 140.7 | 332 |

Figure 3.8: Distribution of Dialysis treatment in Malaysia by state, 1990-2005

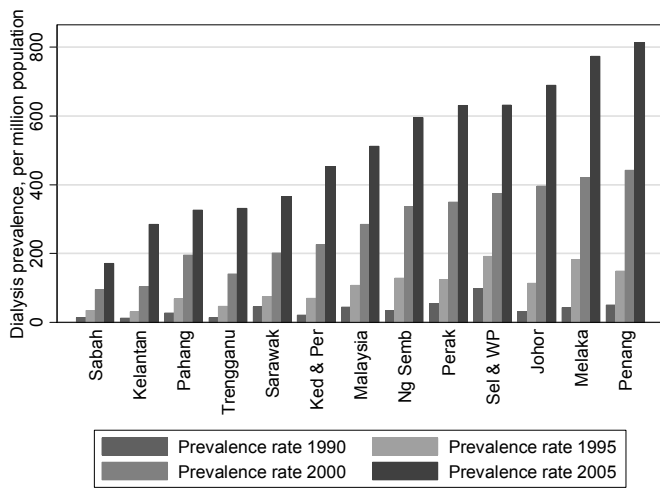


Table 3.9: Trends in dialysis geographic equity as measured by concentration indices

| | 1990 | 1995 | 2000 | 2005 |
|--|-------|--------|--------|--------|
| Dialysis incidence | 13 | 33 | 78 | 119 |
| Dialysis prevalence | 44 | 108 | 285 | 512 |
| Overall Concentration Index (CI) of dialysis provision | 0.091 | 0.065 | -0.02 | -0.04 |
| CI of Public provision | 0.067 | -0.009 | -0.116 | -0.203 |
| CI of NGO provision | 0.164 | 0.184 | 0.106 | 0.076 |
| CI of Private provision | 0.285 | 0.25 | 0.118 | 0.063 |
| Household Income inequality (Gini coefficient) | 0.442 | 0.456 | 0.443* | 0.462# |

Figure 3.9(a): Trends in dialysis geographic equity in Malaysia, 1990-2005

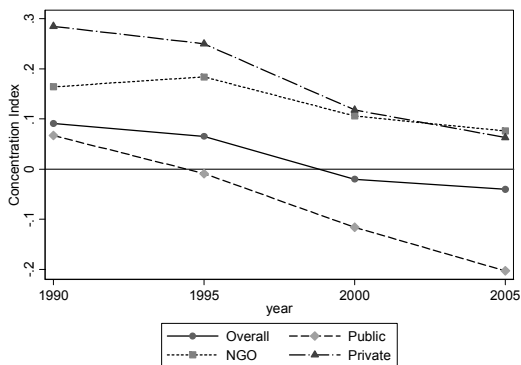


Figure 3.9(b): Concentration curves of geographic distribution of dialysis treatment by provider sector, 2005

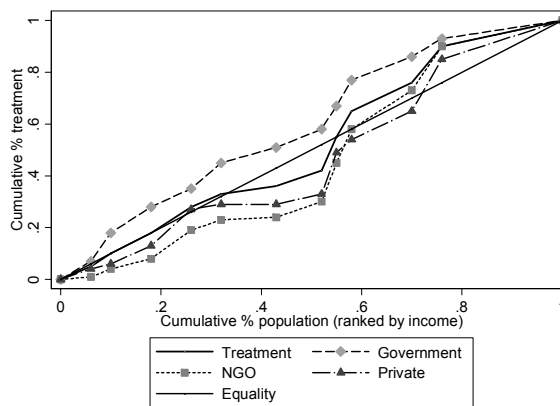


Table 3.7: Dialysis financing equity, 2005

| Sector | Index | |
|---------|---------------|---------|
| | Concentration | Kakwani |
| Public | 0.41 | -0.053 |
| Private | 0.02 | -0.443 |
| Overall | 0.28 | -0.18 |

Figure 3.7: Dialysis financing equity as measured by Kakwani index, 2005

