

# Identifying Factors That Influence Physicians' Recommendations for Dialysis and Conservative Management in Indonesia



Eric A. Finkelstein<sup>1</sup>, Semra Ozdemir<sup>1</sup>, Chetna Malhotra<sup>1</sup>, Tazeen H. Jafar<sup>1,2</sup>, Hui Lin Choong<sup>2</sup> and Johnny Suhardjono<sup>3</sup>

<sup>1</sup>Duke-NUS Medical School Singapore, Singapore; <sup>2</sup>Singapore General Hospital, Singapore; and <sup>3</sup>Faculty of Medicine, University of Indonesia, Jakarta, Indonesia

**Introduction:** For elderly end-stage renal disease (ESRD) patients with multiple comorbidities, dialysis may offer little survival benefit compared to conservative management (CM). Yet, many elderly ESRD patients undergo dialysis, partly due to physicians' recommendations regarding treatment choice. This study aims to elucidate the factors that influence these recommendations.

**Methods:** We surveyed a convenience sample of physicians who attended the 9th Asian Forum of Chronic Kidney Disease Initiative conference. We used vignettes that vary by age and comorbidity status, and asked physicians to recommend dialysis or CM for a hypothetical patient with that profile and to predict survival with both treatment options. We also compared the physician's recommendations to patients for what they would recommend for themselves if they were diagnosed with ESRD.

**Results:** On average, physicians believed that dialysis extends life relative to CM. Yet, a large subset believed that CM confers greater survival. Estimates range from 17.3% (for a 65-year-old with diabetes and CHF) to 50% for patients with advanced cancer. Results further reveal high discordance regarding treatment recommendations. For a 65-year-old patient with diabetes, 62% recommended dialysis and 38% did not. For advanced cancer, the split was 25% and 75%. Physicians were far more likely to recommend dialysis for themselves than for their patients.

**Discussion:** This study suggests that physicians would benefit from a greater understanding of survival benefits of dialysis and CM for elderly patients with different comorbidity profiles. This would allow patients to make more informed decisions.

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**KEYWORDS:** comorbidities; conservative management; dialysis; end-stage renal disease; survival benefits; treatment recommendation

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End-stage renal disease (ESRD) is a global public health challenge, with 2.6 million people currently on renal replacement therapy (e.g., dialysis) worldwide. This number is projected to double by 2030, with a majority living in Asia Pacific countries.<sup>1</sup> Although dialysis has been shown to be effective in prolonging survival,<sup>2,3</sup> for very elderly patients with multiple comorbidities, dialysis may offer little to no survival benefit compared to conservative management (CM), which focuses on pharmacological management of symptoms, dietary control, and supportive care.<sup>4,5</sup>

There is a significant cost to patients and families resulting from dialysis. For example, patients must spend long hours being dialyzed either at home or at a dialysis center, with the latter also requiring additional travel time and costs. Dialysis patients also have greater rates of hospitalization,<sup>6</sup> report lower life satisfaction,<sup>7</sup> and are less likely to die at home, which many patients prefer.<sup>6</sup> As a result, even in cases in which dialysis confers moderate survival benefits, this may not be the preferred option for many elderly patients; yet, evidence shows that a majority receive dialysis when it is available.<sup>8,9</sup> Although many factors may be responsible for this, physician recommendations have been shown to strongly influence ESRD patients' treatment choices, especially in Asian countries.<sup>10,11</sup> However, the factors that influence these recommendations remain largely unknown.

**Correspondence:** Eric A. Finkelstein, Lien Centre for Palliative Care, Duke-NUS Medical School Singapore, 8 College Road, Singapore-169857, Singapore. E-mail: [eric.finkelstein@duke-nus.edu.sg](mailto:eric.finkelstein@duke-nus.edu.sg)

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The issues are particularly complex in Indonesia, the fourth most populous country in the world, with more than 255 million people, a significant proportion of elderly individuals (8%), a rising burden of ESRD, and a health care system with substantial out-of-pocket costs for dialysis, albeit aspiring for universal coverage by 2019.<sup>12</sup>

Therefore, we conducted this study with the objective of elucidating the factors that influence physicians' recommendations for dialysis and conservative management. This study relies on a survey fielded to physicians who practice in Indonesia and attended the 9th Asian Forum of Chronic Kidney Disease Initiative (AFCKDI) conference organized in Jakarta, Indonesia, May 8 to 9, 2015. Indonesia is a lower–middle-income country with a patriarchal society in which the out-of-pocket costs are high and access to dialysis centers is limited despite recent health care reform efforts to increase access to medical care.<sup>13–15</sup>

We used a series of vignettes that vary by age and comorbidity status, and asked physicians to predict the median survival of hypothetical patients depending on whether they undergo dialysis or CM. For each vignette, we then asked them to choose whether they would recommend dialysis over CM. Our main hypotheses are listed as follows: (i) The percentage of physicians who recommend dialysis will decrease as patient age and comorbidity status increase; (ii) physicians will be more likely to recommend dialysis when the hypothetical patient is male and of higher economic status; (iii) most physicians will overestimate the survival benefits of dialysis relative to CM, yet the variance in the estimates will be large; and (iv) physicians with more optimistic assessments about the relative survival benefits of dialysis will be more likely to recommend dialysis to their hypothetical patients when compared to their peers with less optimistic assessments.

Finally, we compared the physician's recommendations for patients to what they would recommend for themselves. If results showed a large variation regarding the expected survival benefits of dialysis and CM, that physicians are making patient recommendations based on factors such as income or gender and/or are making recommendations for patients that are different from choices for themselves, then it suggested that greater physician/patient education regarding pros and cons of dialysis and CM, improved communication between physicians and patients regarding treatment options for ESRD, and greater patient autonomy could help to ensure that the treatments that patients receive are most likely to be consistent with their own preferences.

## METHODS

### Setting and Sample

The survey was made available to a convenience sample of participants attending the 9th Asian Forum of Chronic Kidney Disease Initiative (ACKDI) conference organized in Jakarta, Indonesia, as mentioned above. Nearly 1100 participants attended the conference, and research staff passed out surveys to participants as they registered in the morning and during conference breaks. There was also a booth where participants could come and request a survey at any time during the day. Eligibility for the survey was limited to physicians currently treating or counseling patients with ESRD in Indonesia. Although nearly 1000 survey questionnaires were passed out, it is not clear how many recipients were eligible to participate. In total, 216 attendees completed the survey, and 201 met the eligibility criteria. These surveys make up the analysis sample. Written informed consent was not required by our institutional review board because the survey was anonymous and the institutional review board determined that it posed no more than minimal risks to the respondents.

### Survey Questionnaire

The questionnaire presented a series of vignettes describing hypothetical elderly patients with ESRD. Vignettes are commonly used for investigating clinical practice variation.<sup>16,17</sup> Each respondent was presented with 2 types of vignettes, namely, patient vignettes and self vignettes (Supplementary Table S1). Each patient vignette described hypothetical elderly patients who had been diagnosed with ESRD. These vignettes systematically varied across 4 attributes: age (65, 75, and 85 years); comorbidities (diabetes, diabetes and congestive heart failure, and advanced cancer); socioeconomic status (wealthy, middle class, and poor); and gender (male, female). For each vignette, participants were asked to predict additional years of survival under dialysis and CM and which treatment option they would recommend for each hypothetical patient. In self vignettes, participants were then asked to imagine that they themselves were diagnosed with ESRD at a certain age and comorbidity profile and to choose either dialysis or CM for themselves, given that profile.

The vignettes were created based on an experimental design generated in SAS that ensures efficient parameter estimates for each attribute level. Separate experimental designs consisting of 18 and 6 questions per design were generated for the patient and self vignettes, respectively. Because answering 24 vignette questions would be overly burdensome, the vignettes were subset into blocks such that each respondent

answered 6 patient vignettes and 3 self vignettes. Each patient-vignette block was paired with 1 of the self-vignette blocks resulting in  $(3 \times 3)$  9 versions. Each respondent was randomly assigned to 1 of the 9 versions. The survey instrument was pilot tested before finalizing the vignette descriptions and was approved by the institutional review board at the National University of Singapore.

### Data Analysis

We first report the mean and SD of the survival predictions by the physicians for dialysis and CM for each vignette, and test whether the differences in predictions are statistically significant using a *t* test. The SD of each prediction and of the difference in predictions provides information on the variability of the estimates. As is common practice, we consider any estimate with a SD that is greater than the mean to be highly variable.<sup>18</sup> We also report the percentage of respondents who believe CM to confer greater life expectancy than dialysis, with estimates nearing 50% also conferring high levels of variability. Finally, we compare physicians' survival predictions with survival estimates published in the literature based on similar patient populations.

We next report the percentage of physicians who recommend dialysis for each hypothetical patient. We report this estimate in total, and separately based on whether the physicians are more optimistic or less optimistic about the relative survival benefits compared to their peers. We categorized more optimistic physicians as those who estimated the relative survival under dialysis for a given vignette to be above the mean prediction. We then used a 2-sample test of proportions to test whether those with more optimistic assessments would be more likely to recommend dialysis for each patient vignette.

To quantify the independent effect of age, comorbidity status, gender, income, and physician's specialization on their choice of dialysis or CM for each vignette targeting (i) a hypothetical patient and (ii) the physician, we conducted 2 logistic regression analyses. In each regression the dependent variable was set to 1 if physicians recommended dialysis (either for the patient or for themselves) and 0 otherwise. Independent variables included dummy variables representing the characteristics for each vignette and physician specialization (nephrologist or other) with age 65 years, diabetes, wealthy, male, and nonnephrologists as the omitted reference groups. For the physician choice, we coded each vignette using the physician's self-reported socioeconomic status and gender. Using the predicted probabilities from the 2 regressions we tested whether

physicians make recommendations for themselves that are different from those for their (hypothetical) patients using a Wald test with the predictions estimated for an individual who is middle class (which the vast majority of physicians report), with the male dummy variable set to 0.6, reflecting the gender mix among physicians who responded to the survey, and nephrologists dummy set to 0.2, reflecting the mix of nephrologists and other physicians among the respondents. All analyses were conducted using STATA version 12.1 (StataCorp, College Station, Texas).

## RESULTS

A total of 201 physicians who met the eligibility criteria completed the survey. The mean age of the respondents was 45 years. Of the respondents, 60% were male, with specialties divided among internist (35%), general practitioner (24%), nephrologist (22%), and unknown (not reported) (19%). Roughly half of the respondents were affiliated with a public hospital. Respondents had, on average, 8 years of experience treating/counseling ESRD patients and had treated and/or counseled an average of 52 ESRD patients per week (Table 1).

Table 2 shows physicians' predictions for expected years of survival under dialysis and CM for each vignette. As expected, as age and comorbidity status increase, the survival estimates decrease, regardless of treatment choice. In the best case scenario, physicians predicted that a 65-year-old patient with diabetes would live an additional 6.8 years under dialysis, whereas survival for an 85-year-old patient with advanced cancer was predicted to be only 1.5 years under CM. Regardless of the profile, physicians, on average, believed that dialysis confers greater survival benefits than CM, with estimates ranging from 3.3 years more for a 65-year-old ESRD patient with diabetes only to roughly 1 year or less for an 85-year-old ESRD patient and/or for an ESRD patient with advanced cancer. Supplemental analyses showed no

**Table 1.** Physician characteristics (N = 201)

Characteristic	Statistic
Age, mean (SD)	45 (12)
Male, %	60
Specialization, %	
Internist	35
General Practitioner	24
Nephrologist	22
Unknown (not reported)	19
Primary affiliation with public hospital, %	51
Years of experience treating/counseling ESRD patients, mean (SD)	8 (8.2)
No. of patients treated/counseled per week, mean (SD)	52 (67.6)

ESRD, end-stage renal disease.

**Table 2.** Physicians' predictions for expected years of survival with dialysis and conservative management (CM) for different patient profiles

Comorbidity	Age, yr	Expected years of survival		Relative survival benefits <sup>a</sup> of dialysis over CM, yr	Percentage of physicians who predict CM to confer greater survival, %	Survival estimates for dialysis <sup>b</sup> Mean (95% CI) (B)
		Dialysis (A)	CM	Mean (SD)		
Diabetes	65	6.8 (4.2) <sup>b</sup>	3.5 (2.8)	3.3 <sup>c</sup> (3.9)	23.6	6.4 (6.3–6.5)
	75	6.1 (3.5)	4.2 (3.0)	1.9 <sup>c</sup> (3.3)	35.7	5.0 (4.8–5.1) <sup>d</sup>
	85	3.8 (2.9)	2.6 (2.9)	1.2 <sup>c</sup> (3.0)	30.9	3.0 (2.8–3.3)
Diabetes and CHF	65	5.7 (3.2)	3.0 (2.1)	2.7 <sup>c</sup> (2.8)	17.3	5.1 (5.0–5.3)
	75	4.4 (2.8)	2.4 (1.6)	2.0 <sup>c</sup> (2.2)	22.7	4.1 (3.9–4.3)
	85	3.6 (2.0)	2.6 (1.6)	0.9 <sup>c</sup> (1.8)	36.2	2.8 (2.5–3.2) <sup>d</sup>
Advanced cancer	65	2.8 (2.5)	2.1 (2.1)	0.7 <sup>c</sup> (1.8)	53.6	–
	75	2.4 (2.3)	1.7 (1.6)	0.7 <sup>c</sup> (1.8)	48.7	–
	85	2.1 (2.0)	1.5 (1.5)	0.6 <sup>c</sup> (1.4)	51.4	–

Numbers in parentheses are SDs. CHF, congestive heart failure; CI, confidence interval.

<sup>a</sup>Relative survival benefits of dialysis is the difference in expected years of survival under dialysis as published in Kan et al.<sup>19</sup>

<sup>b</sup>Survival estimates for dialysis from Kan et al.<sup>19</sup>

<sup>c</sup>Significance at  $P < .01$  level.

<sup>d</sup>Significant difference between (A) and (B) at  $P < 0.05$  level.

difference in predictions between nephrologists and other physicians (Supplementary Table S2).

Despite the finding that physicians, on average, believe that dialysis extends life relative to CM, there is a high degree of uncertainty in the predictions. This is evidenced by the large SD for all vignettes considered and the fact that a significant number of physicians believed that CM confers greater survival, with proportions ranging from a low of 17.3% for a 65-year-old patient with diabetes and CHF to a high of roughly 50% for a patient with advanced cancer. The latter result is what one would expect to see if physicians were making random guesses.

Table 3 shows the percentage of physicians who recommend dialysis for each patient vignette in total and separately for more optimistic and less optimistic physicians when compared to their peers. Results reveal high discordance in treatment recommendations. For a 65-year-old patient with diabetes, for whom the best case can be made for dialysis, only 62% of physicians recommended it. As the age and comorbidity profiles increased the percentage who recommended

dialysis decreased to as low as 34% (85-year-old with diabetes and CHF). Yet, even for those with advanced cancer, at least one-fourth of physicians recommended dialysis. The second and third columns of Table 3 show that the recommendations were largely influenced by beliefs about relative survival benefits. Not surprisingly, those who were more optimistic about the ability of dialysis to extend life were far more likely to recommend it to their (hypothetical) patients, even if the patient had advanced cancer. These findings point to the importance of educating physicians about expected survival associated with dialysis and CM in order for them to make informed treatment recommendations.

Table 4 presents results of the logistic regressions. For the patient vignettes, age 85 years, advanced cancer, and being poor decreased the odds of the physician recommending dialysis. Being a nephrologist increased the odds of recommending dialysis to the patients. When considering choices for themselves, only advanced cancer decreased the odds and being 75 years of age (relative to 65 years) and middle class (relative to wealthy) increased the odds of choosing dialysis.

Based on the regression results, Table 5 shows the predicted probabilities of the physicians recommending dialysis for their hypothetical patients and for themselves. Results show that for each vignette physicians were far more likely to recommend dialysis for themselves than for their patients. For example, whereas 55% of physicians recommended dialysis for a hypothetical 75-year-old patient with diabetes and CHF, this figure climbed to 82% when physicians considered their own choices.

**Table 3.** Percentage of physicians recommending dialysis for hypothetical patients

Comorbidity Profile	Age, yr	% of Physicians who recommend dialysis		
		% of All physicians	% of More optimistic physicians	% of Less optimistic physicians
Diabetes	65	62.4	81.8	49.2 <sup>a</sup>
	75	56.6	69.1	43.1 <sup>a</sup>
	85	51.8	75.9	28.6 <sup>a</sup>
Diabetes and CHF	65	61.8	84.3	42.4 <sup>a</sup>
	75	57.8	81.5	22.7 <sup>a</sup>
	85	34.3	43.4	25.0 <sup>b</sup>
Advanced cancer	65	29.0	45.2	18.5 <sup>a</sup>
	75	25.2	45.5	11.9 <sup>a</sup>
	85	27.5	57.9	11.3 <sup>a</sup>

More optimistic physicians and less optimistic physicians are those who predict higher and lower than mean years of relative survival benefit of dialysis for the specified patient profile. CHF, congestive heart failure.

<sup>a</sup> $P < 0.01$  for differences between more optimistic physicians and less optimistic physicians recommending dialysis for patients.

<sup>b</sup> $P < 0.05\%$ .

## DISCUSSION

As noted in the introduction, many ESRD patients and their surrogates rely on their physicians to educate them on the relative benefits of dialysis over CM and to recommend a treatment option. To gauge physicians'

**Table 4.** Odds of physicians recommending dialysis for patient and self

	Odds ratio (95% confidence interval)	
	Dialysis for patient	Dialysis for self
Age, yr		
65	–	–
75	0.985 (0.743, 1.305)	2.180 <sup>a</sup> (1.475, 3.221)
85	0.635 <sup>a</sup> (0.489, 0.825)	0.889 (0.608, 1.300)
Comorbidities		
Diabetes	–	–
Diabetes and CHF	1.213 (0.917, 1.605)	1.340 (0.909, 1.976)
Advanced cancer	0.402 <sup>a</sup> (0.297, 0.545)	0.321 <sup>a</sup> (0.218, 0.472)
Socio-economic status		
Wealthy	–	–
Middle class	1.006 (0.739, 1.369)	1.481 <sup>b</sup> (1.049, 2.091)
Poor	0.692 <sup>b</sup> (0.518, 0.923)	1.204 (0.589, 2.463)
Gender		
Male	–	–
Female	0.999 (0.799, 1.248)	1.224 (0.860, 1.743)
Physician specialization		
Other	–	–
Nephrologist	1.511 <sup>a</sup> (1.140, 2.003)	0.781 (0.521, 1.171)
Log-likelihood	–772.488	–373.551
n	201	200

CHF, congestive heart failure.  
 Dash (–) indicates reference category.  
<sup>a</sup>P < 0.01%  
<sup>b</sup>P < 0.05%.

understanding of these benefits, we asked them to predict survival for dialysis patients with specific age/comorbidity profiles and compared the predictions to published results from a study conducted in Taiwan.<sup>19</sup> We used the Taiwanese study because we could not find any study from Indonesia that reported survival for dialysis patients with comparable comorbidities. Assuming that the results from Taiwan are accurate for Indonesia, many physicians overestimated survival benefits for 75- and 85-year-old patients with diabetes and for 85-year-old patients with diabetes and CHF (Table 2). If, within each of the subgroups considered,

**Table 5.** Predicted probabilities of physicians recommending dialysis to patients and choosing dialysis for themselves

Comorbidity	Age, yr	Predicted probabilities of recommending/choosing dialysis for patient or self	
		Dialysis for patient	Dialysis for self
Diabetes	65	0.52	0.62 <sup>a</sup>
	75	0.50	0.78 <sup>b</sup>
	85	0.39	0.59 <sup>b</sup>
Diabetes and CHF	65	0.55	0.68 <sup>c</sup>
	75	0.55	0.82 <sup>b</sup>
	85	0.44	0.66 <sup>b</sup>
Advanced cancer	65	0.29	0.34
	75	0.28	0.53 <sup>b</sup>
	85	0.20	0.31 <sup>c</sup>

Probabilities are calculated assuming SES as middle class, as 75% of the physicians represent middle class and weighted for gender and physician specialization. CHF, congestive heart failure.  
<sup>a</sup>P < 0.05%, <sup>b</sup>P < 0.01%, and <sup>c</sup>P < 0.1% for difference in predicted probabilities of recommending dialysis for patients and self.

the patient profile and/or treatment benefits differ between Indonesia and Taiwan, then these comparisons may be invalid. No comparable estimates were available for elderly patients with advanced cancer. However, even if the Taiwanese study<sup>19</sup> results do not generalize to Indonesia, the variability in physician responses for any given patient profile suggests that many physicians have inadequate knowledge on the relative survival benefits of dialysis and may be giving advice based on opinion, dated evidence, or misinformation.

There are several possible reasons for these results. As noted in the preceding paragraph, no Indonesian data have been published that focus on survival outcomes for ESRD patients of any age as a function of treatment choice. Physicians may also not be aware of the survival scoring systems available online that provide this information ([http://nephron.org/cgi-bin/rpa\\_sdm.cgi](http://nephron.org/cgi-bin/rpa_sdm.cgi)), although, based on data from western countries, and even if physicians are aware, use of these systems may be limited due to connectivity, time, and other constraints. Moreover, these survival scoring systems present 1- and 2-year survival probabilities for dialysis patients of varying age and comorbidity profiles, which is not easily translated to median survival. The scoring system also estimates survival probabilities for dialysis only, so it provides no information on survival for those who opt for CM. Many physicians may wrongly believe these estimates are relative to what would be achieved by CM and thus are overly optimistic about the relative benefits.

The published literature is also not clear on the relative survival benefits of CM for older patients with comorbidities. There are only a few studies that investigate this issue. These studies differ on their methodological approach, inclusion criteria, and their definition of what constitutes multiple comorbidities. For example, Murtagh *et al.*<sup>4</sup> reported that the survival advantage of dialysis over CM was lost for patients more than 75 years old with high comorbidity, although their results were based on counts of the number of comorbidities only, whereas Chandna *et al.*,<sup>5</sup> who reported a (non–statistically significant) 4-month survival advantage for dialysis, defined their profiles using both severity and number of comorbidities. The US Renal Physician Association, when describing the patient population who may not benefit from dialysis, used a modified Charlson Comorbidity Index to define “high comorbidity” based on a combination of number and severity of comorbidities.<sup>20</sup> Finally, because dialysis is clearly effective for younger, healthier populations, many physicians may have a preconception bias<sup>21</sup> that dialysis will be efficacious even for older and highly comorbid patients. This preconception bias could partly explain why more than 20% of physicians

recommend dialysis even for vignettes in which the patient has advanced cancer.

More research is needed to clarify the relative survival benefits of CM for patients with varying age and comorbidity profiles, and this information needs to be conveyed to clinicians and patients in a manner that will allow them to make informed decisions. It is especially important to educate patients directly, as the results suggest that physicians are likely to be making decisions based on nonclinical factors, including income. There may be valid reasons to consider income in the decision to undergo dialysis, as physicians possibly base their recommendations taking into account their previous experience with other patients belonging to similar income groups, noting that despite commendable efforts to improve access to renal replacement therapy, out-of-pocket costs of dialysis are still considerable in Indonesia<sup>12</sup> and present a barrier to optimal treatment. Socioeconomic status may become less of a factor in the future if universal coverage takes on a larger fraction of the costs, but it remains to be seen how large a fraction this will be. Regardless, this decision is best left to the patient once survival, costs, quality of life, and other factors are appropriately considered.

The finding that physician specialty influences treatment recommendations is not new. It is well established that surgeons are more likely than other clinicians to recommend surgery.<sup>22,23</sup> Consistent with this paradigm, it is not surprising that nephrologists are more likely than the other clinicians included in the survey to recommend dialysis, given that dialysis is the primary treatment modality for most of their ESRD patients. Regardless, this is an important point that patients should be aware of when seeking treatment advice.

The findings suggest that physicians are more likely to choose aggressive treatments for themselves than for their patients. This dichotomy is similar to that shown in several prior studies.<sup>24,25</sup> It is possible that physicians believe that they would make better dialysis patients. This would occur if they believed that they were more likely to take mitigation strategies to avoid infection and other adverse events. However, this is one of several possible motives underlying this result. Determining the true cause should be an area of future research.

This study has several limitations. First, results are based on a convenience sample of physicians participating in a conference in Jakarta. Although results are unlikely to generalize to all physicians, those who attend international kidney conferences are likely to be most up to date on the relative benefits of dialysis. Second, we could not calculate the response rate, as the number of eligible respondents was not known among the conference participants. Third, as with all surveys, results are based on hypothetical vignettes. However,

there is no reason to believe that the expectations of the relative survival estimates are biased or that these estimates would not influence real-world choices. In the real world, it is likely that physicians consider many additional factors that we could not include in a brief survey, such as patients' physical or cognitive capabilities, proximity to a dialysis center, or level of caregiver support. Future studies can further explore the extent to which these and other factors influence treatment recommendations.

In conclusion, this study suggests that physicians and, by extension, their patients would benefit from a greater understanding of the survival benefits of dialysis and CM for elderly patients with different comorbidity profiles. However, because this information is generally not available for Indonesian patients or for those in other countries in Asia, more research is needed before that information can be disseminated. Once available, this information can be conveyed to patients in an easily understandable format so that they can make more informed decisions about which treatment strategy is best for them. Shared decision making should be promoted so that patients' beliefs and preferences are taken into account when these decisions are being made. As Indonesia moves toward universal coverage of renal replacement therapy, expected to be completed by 2019, greater access to information and strategies that ensure cost effective use of health services will be increasingly important.

## DISCLOSURE

All the authors declared no competing interests.

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## SUPPLEMENTARY MATERIAL

**Table S1.** Example patient-vignette and self-vignette questions

**Table S2.** Relative survival benefits of dialysis for different patient profiles, stratified by physician specialty (nephrologists versus others)

Supplementary material is linked to the online version of the paper at <http://www.kireports.org>.

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