

# Public perceptions of the factors that constitute a good healthcare system

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## ABSTRACT

**Introduction:** In Singapore, few studies have been done on the factors that the general public considers to be most important in the healthcare system. We conducted this pilot study to determine the factor structure, reliability and validity of statements in a healthcare survey questionnaire as predictors of public perception of a good healthcare system.

**Methods:** Data on public perceptions of healthcare from a national survey of 1,434 adult Singaporeans was analysed using a principal component analysis and regression, to obtain the factors and predictors. The survey employed 31 statements on healthcare quality, cost, access and the role of the individual vis-à-vis society, which participants ranked on a five-point Likert scale.

**Results:** The exploratory factor analysis identified six critical factors (F): National healthcare financing framework (F1), Service at public institutions (F2), Service at private institutions (F3), Individual responsibility for health (F4), Affordability at public institutions (F5), and Affordability at private institutions (F6). These factors explained 54 percent of variance, and Cronbach's alpha ranged from 0.5 to 0.72, except for F1. Regression analysis showed an association of public perception of good healthcare in Singapore with the following factors: F2 (odds ratio [OR] 1.79, 95 percent confidence interval [CI] 1.48–2.16, p-value is less than 0.0001); F3 (OR 1.29, 95 percent CI 1.10–1.52, p-value is less than 0.0001); F5 (OR 1.52, 95 percent CI 1.27–1.83, p-value is less than 0.0001); F1 (OR 1.31, 95 percent CI 1.08–1.59, p-value is 0.01); F4 (OR 1.33, 95 percent CI 1.16–1.54, p-value is less than 0.0001); but not with F6.

**Conclusion:** This pilot study provides a practical, reliable and valid first perception second level matrix to assess the Singapore healthcare

system. Further snapshot surveys to assess perceptions of the healthcare system should be conducted with questionnaires abridged to include only these five identified critical factors.

**Keywords:** healthcare system, Singapore healthcare system

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## INTRODUCTION

The expectations of the public to receive the “best possible care” in the developed country setting is increasingly tenuous, given the competing and often conflicting demands on the finite resources available in healthcare.<sup>(1)</sup> While governments the world over are facing increasing challenges of providing high quality and financially sustainable public healthcare, public expectations of better health and better healthcare are also rising, driven by the spread of information, growing political and economic empowerment, and aggressive marketing by pharmaceutical and medical device manufacturers.<sup>(2)</sup> Furthermore, it is naïve to assume a “one size fits all” perspective of what society desires from its healthcare system and to apply research and findings from different countries with different societal norms and expectations brusquely into any given health system. The plurality of the healthcare delivery and financing systems in the world suggests powerful and highly conceptualised social influences on the healthcare system, and it has now become essential to carefully study consumers' needs and expectations locally, to determine the appropriate allocation of healthcare resources.

Healthcare systems are typically discussed in academia, based on the consideration of cost, quality and access. This is a useful conceptual framework, but it does not take into account consumers' preferences and the unique considerations of balancing the trade-offs between the three dimensions of cost, quality and access. In fact, studies in developing countries have shown that patients' preferences are influenced by a variety of other factors, including the service attitude of the providers, and that the final choice is determined by a complex interplay of these factors.<sup>(3)</sup> Studies in the developed world are not dissimilar. In the United Kingdom (UK), a majority of the public

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believed that they would receive the best possible care that is most suited to their needs under the UK National Health Service, irrespective of their ability to pay. However, the research done by a network of health professionals showed that due to cost issues and the breaking of trust with professional groups, this was not necessarily always the case.<sup>(1)</sup> In Australia, a nationwide telephone survey of 800 adults carried out in 2007 showed a strong support for the current healthcare system, but also revealed fairly weak “pro-private” attitudes and strong “pro-public” attitudes, suggesting an inherent Australian bias towards publicly-offered healthcare services.<sup>(4)</sup> The perceptions of Canadians about their healthcare system were discussed in a report to the Health Council of Canada, which reported that the highest priority for Canadians was timely access to care, while quality of care was also a major concern.<sup>(5)</sup> In another study, Italian citizens questioned the quantity and quality of the services provided by the Italian healthcare system, even though the World Health Report 2000 had ranked the Italian healthcare system second among 191 countries, with respect to health status, fairness in financial contribution and responsiveness to people’s expectations of the health system.<sup>(6)</sup>

In Singapore, the government examined the role of state healthcare financing and provisions. It was decided that while the government would continue to subsidise healthcare to bring the prices down to an affordable level, Singaporeans would have to share in the cost of the services they consume.<sup>(7)</sup> The abovementioned studies suggest that developed countries which had conducted similar public surveys reported a similar finding of multiple factors impacting the perception of healthcare quality. Healthcare quality throughout the world is not straightforward. It is an “objective” assessment and depends on a complex interplay of factors, including actual quality of care delivered, timeliness and cost of services, public expectations and underlying societal values. Therefore, there is a need to develop an instrument to help providers better understand the multiplicity of perspectives and issues on which healthcare consumers base their healthcare decisions. It would be expensive and impractical to ascertain *de novo* these myriad elements each time a research is conducted; and we believe factor analysis is an effective and efficient method which can be used for identifying underlying dimensions in a group of variables and for developing an instrument that is a brief, practical, reliable and valid measure of public perception of healthcare.<sup>(8)</sup>

A few countries have looked at some of the dimensions of healthcare delivery. For example, using data on 14 European countries, the Eurobarometer survey highlighted

the “state responsibility for healthcare provision” and “satisfaction” as two important dimensions in healthcare quality.<sup>(9)</sup> Dutch researchers have developed an instrument to measure different dimensions of public trust in healthcare in the Netherlands and had used Cronbach’s alpha and exploratory factor analysis to show construct validity.<sup>(10)</sup> In Singapore, few studies have been conducted to determine the factors the general public considers to be most important. We aimed to explore the critical factors that impact public perception of what makes a good healthcare system. and describe the development of a questionnaire and analysis to identify the factors associated with the perception of a good healthcare system.

## METHODS

The methodology for the survey has been previously detailed in Lim and Joshi’s report<sup>(11)</sup> and will only be briefly described here. A telephone survey, using a sample frame generated randomly from the 2005/2006 telephone directory, was conducted in August 2006. Inclusion criteria were restricted to respondents who were older than 21 years of age, who professed to be knowledgeable about the household and who could speak English.

The attributes of public perception of the healthcare system were derived from pre-survey focus group discussions with patients and a survey carried out in 2003 by Lee et al, on behalf of the Singapore government Feedback Unit.<sup>(12)</sup> The items were based on healthcare quality, cost, access and the role of the individual vis-à-vis society. The initial item pool was further reduced to include only items that were clear and not redundant. The emphasis was on using simple and unambiguous wordings and responses. The resulting questionnaire consisted of 31 questions in total, excluding the demographics. Nine items were on the usage of healthcare, 22 items on healthcare perceptions and eight items on demographical characteristics. The responses to each perception item were measured on a five-point Likert scale, ranging from “strongly agree” to “strongly disagree”. The responses to each item on the questionnaire were analysed so that a higher item score indicated a more favourable attitude. The last section captured the demographics, i.e. information on age, gender, race, education, income, occupation and type of housing.

Correlation was used to determine which items were associated. One item, “Singapore has a good healthcare system” was not included in the factor analysis, but was only used as a dependent variable in the multinomial regression analysis (Appendix 1). Before the study began, two experts in face validity revised the Healthcare Questionnaire scale, and it was pilot-tested among eight

**Table I. Demographics of the study population (n = 1,434).**

Demographics	No. (%) of study population	% of national population
Gender (n = 1,427)		
Male	641 (44.9)	49.7
Female	786 (55.1)	50.3
Race (n = 1,414)		
Chinese	1,051 (74.3)	75.6*
Malay	179 (12.7)	13.6*
Indian	147 (10.4)	8.7*
Others	37 (2.6)	2.1*
Household income (S\$) (n = 1,287)		
< 1,500	225 (17.5)	19.1†
1,500–3,000	451 (35.0)	22.3†
3,001–5,000	379 (29.4)	18.7†
5,001–7,000	118 (9.2)	19.1†
≥ 7,001	114 (8.9)	20.7†
Education level (n = 1,365)		
Primary & below	294 (21.5)	49.0
Secondary	608 (44.5)	37.3
“A” level	238 (17.5)	7.8
University & above	225 (16.5)	5.8

\* Source: General Household Survey 2005<sup>(17)</sup>† Source: Singapore Census of Population 2000<sup>(18)</sup>

respondents for relevance, clarity and reliability. This healthcare instrument was developed to be appropriate in a culturally-diverse community population.

A total of 6,146 telephone numbers were generated, out of which 2,323 people were not contactable. From the remaining 3,823 telephone contacts, 2,040 respondents refused to participate in the survey or did not complete the survey forms. 1,783 respondents completed the survey, giving a response rate of 46.6% (1,783/3,823). The data of the respondents who gave full information (n = 1,434) on all the items related to healthcare, was used for analysis. Of the non-respondents, approximately half were uncontactable at the number listed and the other half declined to participate. There was no difference with respect to ethnic group and housing type, between the respondents and non-respondents. About 90% of the respondents went to polyclinics for primary healthcare and to public hospitals for tertiary healthcare.

Table I shows that the respondents were representative of the general population in ethnicity and housing type, but the lower income households (monthly household income range \$1,501–\$5,000) were over-represented. There were also more females than males. The ethnic distribution was Chinese (74.3%), Malay (12.7%), Indian (10.4%) and other races (2.6%). The mean age and standard deviation of the subjects was 47 ± 14 years.

There was a total of 22 items on healthcare perceptions in the survey form. Two items, viz. “The government should fix the price of medicines in Singapore” and “3 M framework is sufficient to help Singaporeans pay for their healthcare” showed a low correlation (< 0.3) with other

items, and therefore were not considered for analysis. The item “Singapore has a good healthcare system” was used as a dependent variable since all the other items showed a strong association with this, and hence was also excluded from analysis. After removing these three items, there were 19 items which were used for factor analysis (Table II).

To further understand and identify the attributes of healthcare perception, we conducted an exploratory factor analysis of the baseline questionnaire responses. Factor analysis is a statistical technique that reduces a large number of interrelated questions to a smaller number of underlying common factors or domains that are primarily responsible for covariation in the data.<sup>(13)</sup> Reliability was measured in terms of internal consistency. A high internal consistency (recommended as > 0.7) indicated that the items grouped into scale are measuring a similar construct. Validity is demonstrated by an instrument’s ability to respond as expected. We examined the validity of this instrument’s subscales via factor analysis. Correlation was used to determine if the items were correlated with each other, and the principal component analysis (PCA) was used to obtain the factors, after which multinomial regression was applied to obtain the predictors. We followed a standard approach to conducting an exploratory factor analysis.

Factors were identified based on a scree test and the percent of (common) variance accounted for by the given factor.<sup>(14)</sup> Using the scree test, we plotted the eigenvalue (i.e. the amount of variance that was accounted for by a given factor) associated with each factor, and looked for a break between the factors with relatively large eigenvalues

**Table II. Individual statistics of the baseline descriptive healthcare items in the questionnaire.**

Question no.	Item	Mean $\pm$ SD
Q1	I am familiar with the way the Singapore healthcare system works.	3.2 $\pm$ 0.84
Q2	The government provides good and affordable basic medical care to Singaporeans.	3.33 $\pm$ 0.89
Q3	I should be personally responsible for my own health.	4.9 $\pm$ 0.52
Q4	It is my personal responsibility to build my own savings to help pay for my healthcare expenses.	3.62 $\pm$ 0.76
Q5	It is my personal responsibility to buy medical insurance to help pay for my medical bills.	3.42 $\pm$ 0.82
Q6	Both A and C class patients receive good hospitalisation care.	3.71 $\pm$ 0.67
Q7	I can receive good medical treatment at polyclinics.	3.40 $\pm$ 0.79
Q8	I can receive good medical treatment at public hospitals.	3.56 $\pm$ 0.68
Q9	I can receive good medical treatment at GP clinics.	3.59 $\pm$ 0.56
Q10	I can receive good medical treatment at private hospitals.	3.41 $\pm$ 0.75
Q11	Medisave should be used mainly for hospitalisation expenses.	2.94 $\pm$ 1.06
Q12	Medisave should be used mainly by the account-holder himself.	2.43 $\pm$ 1.01
Q13	Medisave should be used at the discretion of the account-holder.	3.88 $\pm$ 0.8
Q14	Healthcare in Singapore is generally affordable.	3.09 $\pm$ 0.91
Q15	Medical services provided at polyclinics are affordable.	3.76 $\pm$ 0.68
Q16	Medical services provided at public hospitals are affordable.	3.23 $\pm$ 0.83
Q17	Medical services provided at GP clinics are affordable.	3.14 $\pm$ 0.89
Q18	Medical services provided at private hospitals are affordable.	2.36 $\pm$ 0.87
Q19	The cost of medicine in Singapore is affordable.	3.03 $\pm$ 0.90
Q20	Singapore has a good healthcare system.	2.98 $\pm$ 0.91

SD: standard deviation

and those with smaller eigenvalues. Factors that appeared before the break were assumed to be meaningful and were retained for rotation. Factors which appeared on the horizontal line after the break were taken into account only for a trivial amount of variance and were therefore not retained. In addition, we specified that we required at least 7% of the variance to be explained by a retained factor and at least 50% of the cumulative variance to be explained by the set of retained factors.

In common factor analysis, the observed items are viewed as a linear combination of factors. When all of the items and factors are rotated and standardised to have a mean of 0 and a standard deviation of 1, the items would be strongly correlated within the factors and independent between the factors. Therefore, varimax rotation was used on the retained factors to help with interpretation.<sup>(13,15)</sup> A rotated solution was interpreted by identifying: (1) which items load on each retained factor; (2) the conceptual meaning of items that load on the same factor; and (3) conceptual differences in items that load on different factors. A pattern loading of  $\geq 0.3$  was used to interpret the results. Cronbach's alpha reliability coefficient was computed for each factor (domain) and the total scale, to measure internal consistency (Table III, last row).<sup>(16)</sup>

## RESULTS

Table I gives the baseline sample characteristics in comparison to the national population. There were 1,434 respondents. There were more females than males (55.1% vs. 44.9%). The correlation of the 22 items on healthcare perception was carried out. Any item within each construct

that was not correlated by at least  $\pm 0.3$  with at least one other item was eliminated from analysis. Two items showed a correlation of  $< 0.3$  with another item and were therefore excluded from the factor analysis. The flow chart in Appendix 1 describes how the items were selected based on the correlation coefficients. Table II provides the descriptive statistics at the baseline of 19 healthcare items as well as another item, "Singapore has a good healthcare system". 76.9% ("strongly agree" 4.8%, "agree" 72.1%) agreed that "Singapore has a good healthcare system", while 15.4% did not give any comment and 7.7% did not agree.

In our sample, most (85%) of the respondents had used services at government institutions, but only 39.6% had used services at GP clinics and 4% at private specialists. 1,434 cases were included in the PCA analysis, aimed to reduce the number of items. The factorability of the items was confirmed by using the Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, where KMO indicates whether or not the variables can be grouped into a smaller set of underlying factors, and a KMO  $> 0.5$  indicates that the factor can be deducted. For this study, a KMO of 0.78 indicated factors that were useful. The number of factors extracted was determined by a scree plot with the criteria of eigenvalue  $> 1$  and at least two items loading on a theoretically-interpretable factor, to give a solution.<sup>(14)</sup>

### Step 1: Determination of the number of retained factors

The scree plot depicts a break before Affordability at private institutions, suggesting that only the first five factors were

**Table III. Factor loadings, mean  $\pm$  standard deviation and reliability coefficients.**

Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
I am familiar with the way the Singapore healthcare system works.				0.388	0.310	
The government provides good and affordable basic medical care to Singaporeans.					0.689	
I should be personally responsible for my own health.	-0.563			0.370		
It is my personal responsibility to build my own savings to help pay for my healthcare expenses.				0.781		
It is my personal responsibility to buy medical insurance to help pay for my medical bills.				0.733		
Both A and C class patients receive good hospitalisation care.		0.335			0.436	
I can receive good medical treatment at polyclinics.		0.651			0.327	
I can receive good medical treatment at public hospitals.		0.658				
I can receive good medical treatment at GP clinics.			0.765			
I can receive good medical treatment at private hospitals.			0.764			
Medisave should be used mainly for hospitalisation expenses.	0.610	0.431				
Medisave should be used mainly by the account-holder himself.	0.604					
Medisave should be used at the discretion of the account-holder.	0.649					
Healthcare in Singapore is generally affordable.					0.746	
Medical services provided at polyclinics are affordable.		0.501			0.631	
Medical services provided at public hospitals are affordable.					0.661	0.406
Medical services provided at GP clinics are affordable.			0.479		0.575	0.749
Medical services provided at private hospitals are affordable.	0.530				0.491	0.884
The cost of medicine in Singapore is affordable.					0.719	
Mean $\pm$ standard deviation.	3.3 $\pm$ 0.72	3.3 $\pm$ 0.09	3.5 $\pm$ 0.02	3.4 $\pm$ 0.04	3.3 $\pm$ 0.08	2.8 $\pm$ 0.03
Reliability.	0.32	0.55	0.56	0.5	0.757	0.596

Factor 1: National healthcare financing framework; Factor 2: Service at public institutions; Factor 3: Service at private institutions; Factor 4: Individual responsibility for health; Factor 5: Affordability at public institutions; Factor 6: Affordability at private institutions

meaningful to retain. The variance which accounted for these five-factor solutions was Service at public and private institutions (20%), Affordability at public institutions (11%), Affordability at private institutions (9%), National healthcare financing framework (7%) and Individual responsibility for health (7%). Therefore, a five-factor solution was chosen based on the scree test and our recommendations that at least 7% variance should be explained by a retained factor and at least 50% of cumulative variance be explained by the set of retained factors.

### Step 2: Rotation of chosen factors

In common factor analysis, the observed items are viewed as a linear combination of the factors. The rotated factor pattern of factor loadings was from the varimax rotation of five factors (with only those showing loadings  $\geq 0.3$ , since loading items  $< 0.3$  were not considered for a factor). We used this matrix to determine which groups of items measured a given factor and interpreted the meaning of each factor.

### Split of Service at public and private institutions

It was noticed that one of the five factors was a combination of affordability at government as well as

private hospitals. As we were interested in distinguishing between affordability at government and private hospitals, we therefore used varimax rotation only on items in a particular factor, which was a composite of affordability at government and private hospitals. KMO = 0.72 and Bartlett's test of sphericity  $p < 0.0001$  extracted two factors with eigenvalue  $\geq 1$  (total variance 57%) as Affordability at government institutions and Affordability at private institutions.

### Step 3: Interpretation of chosen factors

The factor loadings are shown in Table III for Factors 5 and 6. Factor 5 made a large contribution to the variance of the items related to affordability at government hospitals, while Factor 6 gave a large contribution to the variance of the items related to affordability at private hospitals. Therefore, these factors were labelled as Affordability at public institutions and Affordability at private institutions, respectively.

Factor 1 made a unique contribution to the variance of the item regarding Medisave. Because Medisave is related to healthcare financing, this factor was labelled as National healthcare financing framework. As Factors 2 and 3 made convincing contributions to the variance of

**Table IV. Predictors of a good healthcare system (with “strongly disagree” and “disagree” as the reference group).**

Factors	Predictors of a good healthcare system			
	Neutral		Agree	
	OR (95% CI)	p-value	OR (95% CI)	p-value
F1: National healthcare financing framework	1.03 (0.077–1.37)	0.034	1.31 (1.08–1.59)	0.01
F2: Service at public institutions	2.10 (1.6–2.75)	< 0.0001	1.79 (1.48–2.16)	< 0.0001
F3: Service at private institutions	1.26 (0.99–1.61)	0.064	1.29 (1.10–1.52)	< 0.0001
F4: Individual responsibility for health	1.23 (1.0–1.75)	0.05	1.33 (1.16–1.54)	< 0.0001
F5: Affordability at public institutions	2.66 (2.0–2.53)	< 0.0001	1.52 (1.27–1.83)	< 0.0001
F6: Affordability at private institutions	1.08 (0.79–1.48)	0.64	1.03 (0.83–1.27)	0.18

OR: odds ratio; CI: confidence interval

Multinomial regression can be used for more than two categories of a variable. One category is treated as reference and the other categories are compared with the reference category. Here we viewed respondents with “neutral” and “agree” (“strongly agree” & “agree”) responses, compared to those with “disagree” (“strongly disagree” & “disagree”) responses on whether Singapore has a good healthcare system.

The predictors of a good healthcare system were Service at public institutions, Affordability at public institutions, Individual responsibility for health and National healthcare financing framework.

Service at private institutions was a predictor only for those who agreed that Singapore has a good healthcare system.

the items related to service at government hospitals and service at private hospitals, they were named as Service at public and private institutions, respectively. Factor 4 made a unique contribution to the variance of the item regarding familiarity with the Singapore healthcare system, personal responsibility towards one’s own health, personal savings and private insurance, and was labelled as Individual responsibility for health. This gave a total of six factors (variance): Factor 1: National healthcare financing framework; Factor 2: Service at public institutions; Factor 3: Medical service at private institutions; Factor 4: Individual responsibility for health; Factor 5: Affordability at public institutions; Factor 6: Affordability at private institutions. The cumulative variance was 54%.

#### Internal consistency

Cronbach’s alpha was satisfactory for all factors (> 0.5) except for Factor 1 (0.3). Looking at the correlation between the items on Factor 1, this was a modest, but justified (not poor) retention. Item-total correlations were reasonably strong in demonstrating reliability and in supporting that items on the same scale factor measured the same construct.

#### Predictors of a good healthcare system

The six-factor scores were then used as independent variables and “Singapore has a good healthcare system” was used as a dependent variable, which was scored on a five-point Likert scale. Responses for “strongly disagree” and “disagree” were combined, and responses for “strongly agree” and “agree” were combined to get a three-point scale of “disagree”, “neutral” and “agree”. Multinomial regression was used to derive the predictors (Table IV). Two comparisons were made. Respondents

who rated “agree” were compared with those who rated “disagree”, and respondents who rated “neutral” were also compared with those who rated “disagree”. Respondents who rated “agree” were significantly more likely to favour the following factors as compared to those who rated “disagree”: Factor 2 (odds ratio [OR] 1.79,  $p < 0.0001$ ); Factor 5 (OR 1.52,  $p < 0.0001$ ); Factor 4 (OR 1.33,  $p < 0.0001$ ); Factor 1 (OR 1.31,  $p = 0.01$ ); and Factor 3 (OR 1.29,  $p < 0.0001$ ). Respondents who rated “neutral” were significantly more likely to favour the following factors as compared to those who rated “disagree”: Factor 2 (OR 2.10,  $p < 0.0001$ ); Factor 5 (OR 2.66,  $p < 0.0001$ ); Factor 1 (OR 1.03,  $p = 0.034$ ); and Factor 4 (OR 1.23,  $p = 0.05$ ). Factor 3 was not associated with a good healthcare system for the group of respondents who rated “neutral” as compared to “disagree”, and Factor 6 was not associated with a good healthcare system by respondents who rated “neutral” and “agree” as compared to “disagree”.

#### DISCUSSION

A public healthcare perception survey instrument that is easy to understand and administer is an important tool for examining and tracking over time, the factors that predict public perceptions and attitudes of what constitute a good healthcare system. This study describes a first effort to develop a scale that offers a detailed and comprehensive assessment of the public’s perceived perceptions about the healthcare system in Singapore. In this exploratory factor analysis, each criterion to judge interpretability and overall results was met, i.e. at least two items loaded on each retained factor; items that loaded on different factors measured different underlined constructs; and the rotated factor pattern demonstrated most of the items had a loading of  $\geq 0.3$  and low loadings on other factors.

This pilot study presents a reliable and valid six-factor instrument, to quickly identify components of what the public perceives to be a “good healthcare system” in Singapore. The reliability was below the recommended level (0.7) for Factors 2, 3, 4 and 5, and unacceptable for Factor 1. The increasing value of alpha is partially dependent upon the number of items in the scale; however, this has diminishing returns. Cronbach’s alpha can be tested again in the next survey, by adding and deleting a few more questions, especially for healthcare financing.

From the focus group discussions with patients (we used these to come up with the survey questionnaire), we found that patients were less familiar with healthcare financing systems. Also, this sample consisted of more females than males, and 66.0% had up to a secondary level of education. Our results also showed that familiarity with the healthcare system decreased with increasing age (result not shown). This may have resulted in inconsistencies in healthcare financing. Factors 1 and 4 satisfied other criteria, as mentioned above; however, these factors contributed a variance of only 7%. These two factors should be looked into further, in order to increase the variance contributed by each factor, which would then help increase the cumulative variance.

Factors 1, 2, 4 and 5 showed an association with a good healthcare system in Singapore by two categories of respondents, viz. respondents who rated these factors as “neutral” and those who rated them as “agree” or “strongly agree”. However, a significant correlation of Factor 3 with a good healthcare system in Singapore was only observed by respondents who rated this factor as “agree” or “strongly agree”. Finally, Factor 6 was not associated with public perceptions of a good healthcare system in Singapore. We postulate that this is so, as the public sector is the dominant healthcare provider in Singapore (Singapore Health Services and National Healthcare Group, the two largest healthcare groups in Singapore, are both wholly government-owned), and there is currently easy access to public healthcare if the consumer so desires.

This study has a few limitations. The survey population could not include people who were not contactable, either because they did not have a landline telephone connection or they were not listed in the telephone directory. It also excluded people who could not understand English as they were unable to participate in the study. In addition, for the reliability scores for healthcare financing, it was observed that the correlation for healthcare financing was low; hence these limitations should be further looked into.

In summary, this pilot study provides practical, reliable and valid first perceptions of Singapore’s healthcare system from the perspective of its main users. It would be a good idea to conduct a test-retest reliability. Further snapshot surveys to assess perceptions of the healthcare system and the underlying reasons could potentially be conducted with questionnaires abridged to include only these five identified critical factors.

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Appendix I. Flow chart describes the use of items.

