Systematic review of utility values used in the pharmacoeconomic evaluations for schizophrenia: implications on cost-effectiveness results

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BACKGROUND

- Health state utility data are widely used in pharmacoeconomic evaluations. By weighting the lifetime spent in a specific health state over time with utility value associated with the health state, researchers can measure the impact of treatment in terms of quality-adjusted life year (QALY), which is considered an ideal measure of health effect for benefit assessment in an economic evaluation[1].
- Cost-utility analysis (CUA), a type of pharmacoeconomic evaluation which employs QALY as a health outcome, is preferred in many countries which require health technology assessment (HTA) for the drug reimbursement[2-5].
- Though many CUAs were performed for pharmacoeconomic evaluations in schizophrenia[6], how utility values associated with schizophrenia health states were used are unclear.

OBJECTIVES

- To identify how utility values for schizophrenia states are used in pharmacoeconomic evaluations in schizophrenia.
- To assess the impact of different uses of utility values on the cost-effectiveness results.

METHODS

Systematic search

- A systematic search was performed to identify pharmacoeconomic evaluation models in schizophrenia reporting utility values, by updating the search of a previous systematic review[6]. Trial-based CUAs were not considered since they rather collect than elicit utilities during the trials[7].

Data extraction

- The data in Table 1 was extracted from each included study:

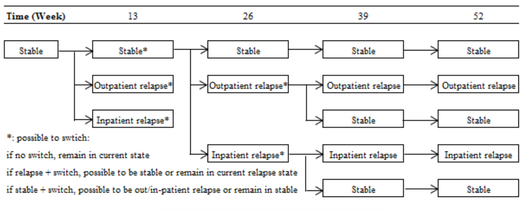
Table 1. Data to be extracted from the CUAs.

Utility value relevant data	
Utility values used in CUA study	• Health states with associated utility value • Detailed definitions of the health states (if available) • Associated sources of the utility values
Utility values selected from elicitation study to use in CUA	• Target countries/regions • Utility elicitation methods • Type of responders (patient, physician etc.) • Interpretation of the health states from the elicitation study into the health states used in the CUA.

Impact on cost-effectiveness results

- Utility values for all schizophrenia health states defined in each CUA were summarised into a set of utility values.
- The model developed by Einarson et al.[8] was replicated with utility values filled with each identified set of utility values to assess the impact on cost-effectiveness results. (Figure 1)

Figure 1. Structure of model to assess the cost-effectiveness results



RESULTS

Search and utility value per health state

- 35 CUAs were identified, with overall 10 health states of schizophrenia with utility values reported in the CUAs. The most frequent value of utility for the most frequent health states are presented in Figure 2.

Sets of utility value for whole schizophrenia health states

- In total, 11 utility elicitation studies[9-19] were used, with 20 sets of utility values for all the health states of schizophrenia (Table 2). Lenert et al.[17] was mostly referred.
- Most of the CUAs (n=27) derived the utility values for all the health states of schizophrenia from a single utility elicitation study, referring 10 utility elicitation studies in total, and the others derived them from the same group of studies composed by 5 utility elicitation studies.
- Though 5 source utility elicitation studies have multiple utility values for the same health states, only Briggs et al.[9] was found to have CUAs using different utility values while referring to this elicitation studies.
- Most CUAs used different health states from the health states defined in the utility elicitation studies, with only 8 CUAs used the same health states.

Impact on incremental QALY and ICER

- There were 17 utility value sets applicable to the model, with the difference between stable and relapse ranging from 0.050 to 0.358, resulting in an incremental QALY ranging from 0.002 to 0.016 and an ICER ranging from 459,293 to 62,302 € per QALY gained in 1-year (Figure 3)

Figure 2. Utility values for schizophrenia states reported by the CUAs

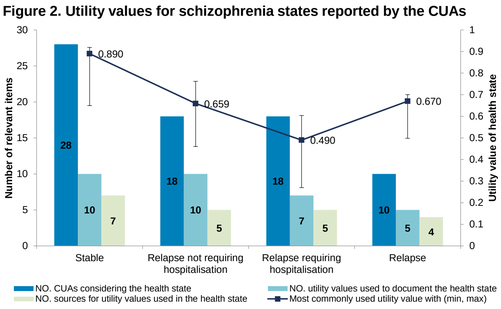


Figure 3. Impact of different sets of utility values on incremental QALY and ICER

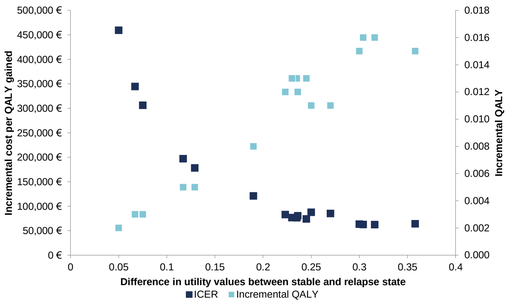


Table 2. The interpretation of health states in utility elicitation studies into the health states in CUAs

Utility study	CUA health state	Value set	Schizophrenia health state in the utility elicitation study			No. CUA
CUA schizophrenia health state: stable, relapse			**stable (schizophrenia)**	**relapse (outpatient)**	**relapse inpatient**	
Lenert [17]	Stable, relapse outpatient/inpatient	# 1	state 1 or 2*	state 3 or 4*	state 6 or 8*	2
		# 2	state 1 or 2*	state 3 or 5*	state 6 or 8*	1
		# 3	state 1	state 3	state 6	1
		# 4	state 1	state 2-3 (average)	state 4-8 (average)	1
	Stable, relapse	# 5	state 1-3 (40%, 30%, 30%)	state 7-8 (60%, 40%)	-	4
	Overall schizophrenia	# 6	state 3	-	-	1
Revicki [10]	Stable, relapse outpatient/inpatient	# 1	outpatient (excellent)	outpatient (negative)	inpatient (acute positive)	1
	Stable, relapse	# 2	outpatient (excellent)	inpatient (acute positive)	-	2
		# 3	current (remission)	inpatient (acute positive)	-	1
Briggs (TTO)[9]	Stable, relapse outpatient/inpatient	# 1	stable	stable, relapse (average)	relapse	3
Briggs (Regression)[9]	Stable, relapse	# 2	stable	relapse	-	2
Osborne[18]	Stable, relapse outpatient/inpatient	# 1	well-controlled/treated	treated, untreated (average)	relapse/untreated	1
Dilla[11]	Stable, relapse	# 1	no relapse	relapse	-	1
König[16]	Overall schizophrenia	# 1	schizophrenia spectrum disorders	-	-	1
Seong[19]	Overall schizophrenia	# 1	other disease	-	-	1
Multiple [9,10,13,14,17]	Stable, relapse outpatient/inpatient	# 1	Average of 5 references[9,10,13,14,17]	Average of 2 references[10, 17]	Average of 2 references[10,13]	7
		# 2	Average of 5 references[9,10,13,14,17]	stable, relapse (average)	Average of 2 references[10,13]	1
CUA schizophrenia state: mild, moderate symptom			**mild (outpatient/inpatient)**	**moderate (inpatient)**		
Oh a[12]	mild, moderate outpatient/inpatient	# 1	mild–inpatient, mild–outpatient	moderate–inpatient	-	2
Glennie [15]	mild, moderate	# 1	mild	moderate	-	1
Oh b[13]	mild, moderate	# 1	mild	moderate	-	1

*: the interpretation of state depends on the adherence level (none, partial, full); relapse/outpatient: relapse not requiring hospitalisation; relapse inpatient: relapse requiring hospitalisation; CUA: cost-utility analysis; TTO: time trade-off;

CONCLUSIONS

- The summary of utility values for the health states of schizophrenia used in CUAs for the pharmacoeconomic evaluation revealed large heterogeneity in the use of these utility values.
- The main sources of heterogeneity included a different selection of utility elicitation studies and a different interpretation of the health states defined in the source into the health states used in the CUA.
- Using different utility values have an important impact on the ICER possibly moving it from far below the accepted threshold to far above, and making room for modifications in order to meet the HTA requirements on economic evidence.
- Consequently, a more rigorous and transparent process of selecting utility values and a sensitivity analysis of different utility values is suggested for future CUAs.

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