ADAPTING LITERATURE-BASED REMISSION RATES FOR CHRONIC SPONTANEOUS/IDIOPATHIC URTICARIA TO THE NEEDS OF A HEALTH ECONOMIC MODEL: A KAPLAN-MEIER APPROACH

PRM86

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BACKGROUND

- Remission, where symptoms spontaneously resolve, is seen in patients with chronic urticaria (CU)
- Chronic spontaneous urticaria (CSU), also known as chronic idiopathic urticaria (CIU), is a subtype of CU
- Limited literature currently exists regarding remission rates among patients with CU and CSU/CIU, and available estimates vary
- Due to the requirements of economic modelling (e.g. cycle length), these estimates cannot be incorporated directly

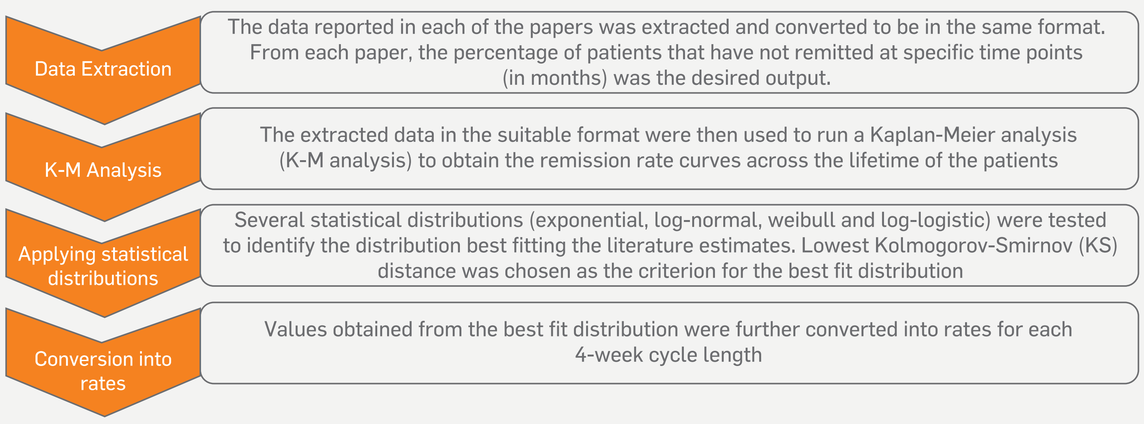
OBJECTIVE

- To adapt published remission rates in CSU patients to the needs of an economic model, using various statistical methods

METHODS

- A systematic review was conducted to identify literature on the natural course of CSU, with a focus on spontaneous remission rates[1]
- From this systematic review, four studies were selected on the basis of a similar study population to the target population in the economic model
  - Beltrani et al. (2002)[2]
  - Toubi et al. (2004)[3]
  - van der Valk et al. (2002)[4]
  - Nebiolo et al. (2009)[5]
- All the four papers reported the proportion of patients that would have undergone/not undergone remission at different time points
- The study by Nebiolo et al[5] reported data for hypertensive (HTN) and non-hypertensive (non-HTN) cohorts. A discrepancy in the text was noted by Southampton Health Technology Assessments Centre (SHTAC) in the paper that switches the HTN and non-HTN cohort while reporting the results. The K-M curve was therefore used as it was considered more reliable and correct estimate from the study. The plots were extracted separately for the HTN and non-HTN curves and the weighted average was considered for the calculations
- The study by van der Valk et al. (2002)[4] reported data for two populations, (i) CSU/CIU only and (ii) all forms of CU; therefore, a total of five populations were considered
- A four-step approach was undertaken to identify the best possible distribution fit for data extrapolation and to generate appropriate remission rates (**Figure 1**)
- Remission rates were calculated for 78 years to correspond to the lifetime horizon used in the cost-effectiveness model

Figure 1. The four-step methodology



RESULTS

- The curve fit using different statistical distributions for all four papers are presented below (**Figures 2–4**)

Figure 2. Curve fit using different distributions on data points from Beltrani[2] and Toubi[3]

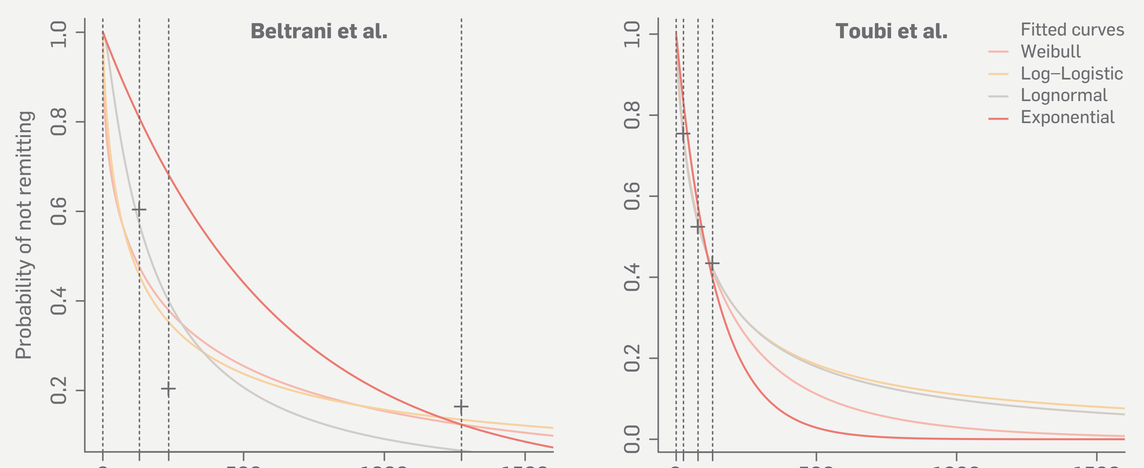


Figure 3. Curve fit using different distributions on data points from van der Valk[4]

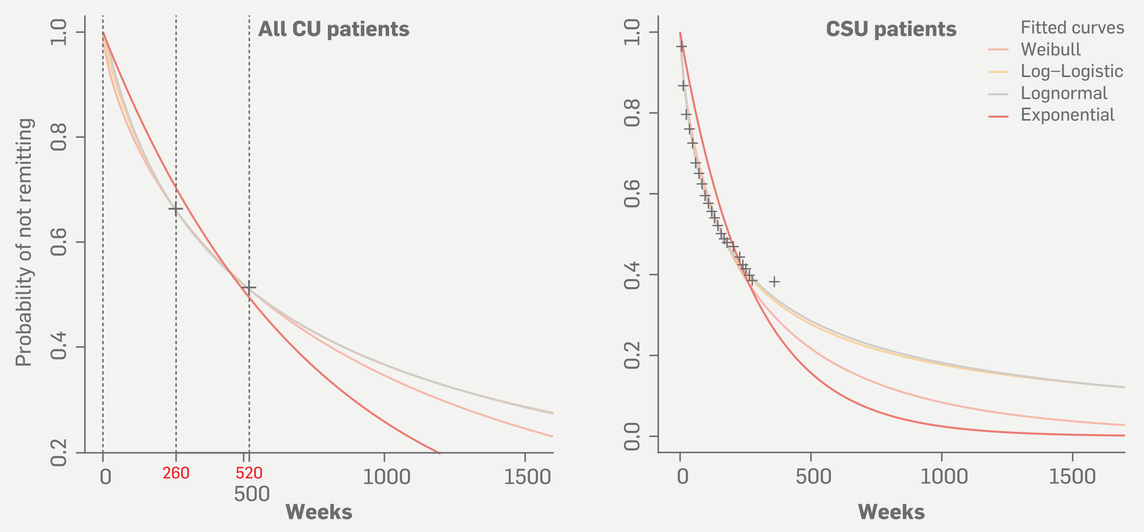
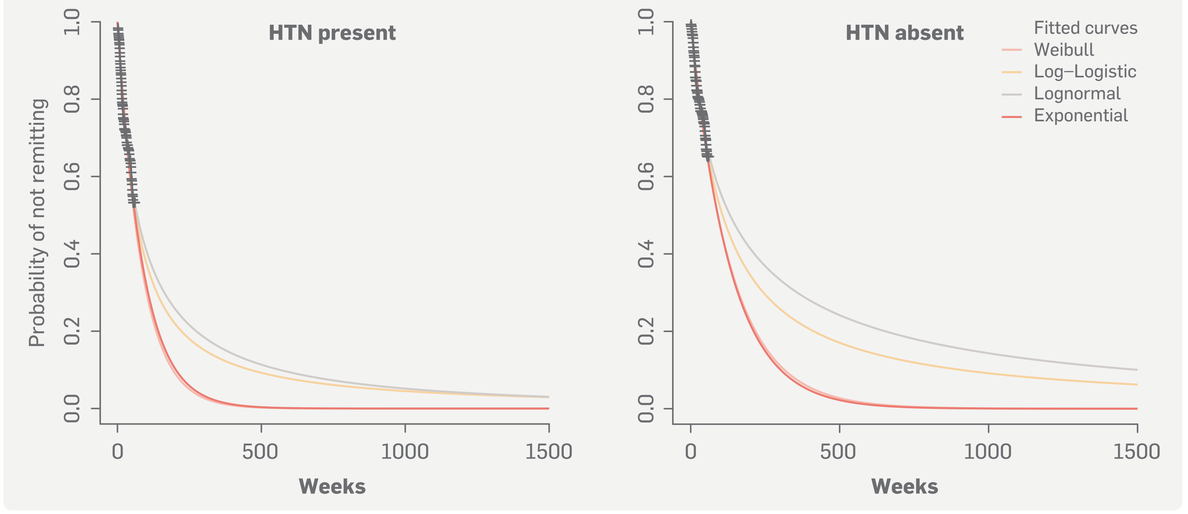


Figure 4. Curve fit using different distributions on data points from Nebiolo[5]



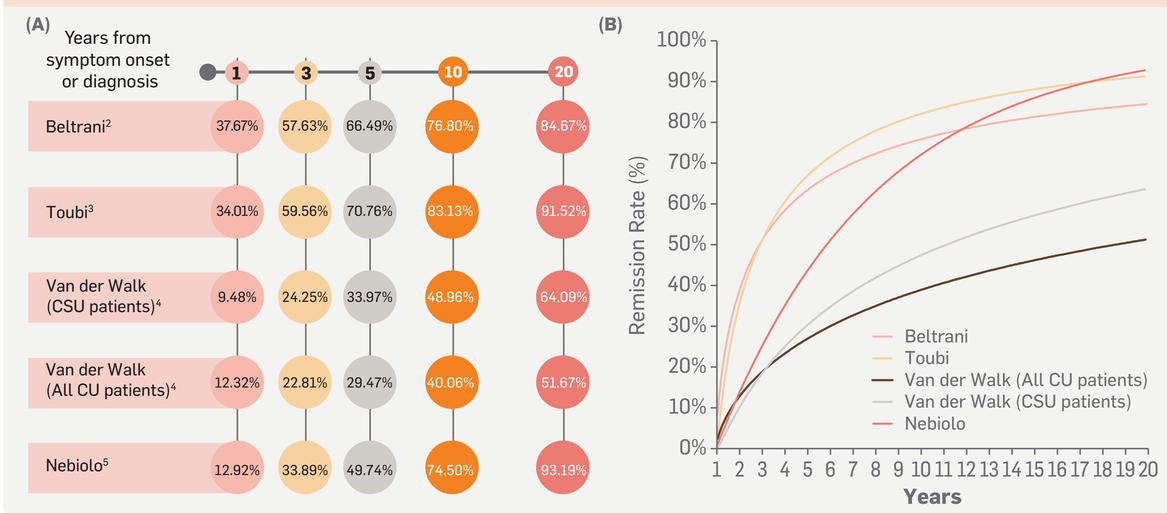
- **Table 1** presents the Kolmogorov-Smirnov (KS) distance, i.e. differential estimates between the expected values and the actual fit values. A lower value means that the distribution is a better fit.

Table 1. K-S distance values for the fitted distributions

Distribution	Beltrani[2]	Toubi[3]	van der Valk (CSU patients)[4]	van der Valk (all CU patients)[4]	Nebiolo[5]
	K-S distance				
Weibull	0.179	0.019	1.66 e-16	0.0428	5.55 e-17
Log normal	0.200	**0.011**	**1.66 e-16**	0.0261	1.66 e-16
Exponential	0.481	0.081	0.042	0.1205	0.099
Log logistic	**0.152**	0.012	2.22 e-16	**0.0233**	**5.55 e-17**

- A summary of remission rates over 1, 3, 5, 10 and 20 years are depicted in **Figure 5A**. Yearly remission rates across 20 years are presented in **Figure 5B**. As the remission rates were calculated per 4-week cycle length, details for the first year are presented in **Figure 5C**.

Figure 5. Summary of remission in patients over time by source



(C)

Cycle	Week	Beltrani	Toubi	van der Walk (All CU patients)	van der Walk (CSU patients)	Nebiolo
1	4	8.33%	2.62%	0.30%	2.42%	1.06%
2	8	13.17%	6.34%	0.92%	3.81%	2.11%
3	12	16.98%	9.93%	1.65%	4.95%	3.15%
4	16	20.19%	13.26%	2.44%	5.95%	4.18%
5	20	22.98%	16.32%	3.25%	6.86%	5.20%
6	24	25.45%	19.14%	4.06%	7.69%	6.20%
7	28	27.67%	21.74%	4.87%	8.46%	7.19%
8	32	29.69%	24.15%	5.67%	9.19%	8.17%
9	36	31.53%	26.39%	6.46%	9.88%	9.14%
10	40	33.24%	28.48%	7.24%	10.53%	10.10%
11	44	34.82%	30.44%	8.00%	11.15%	11.05%
12	48	36.29%	32.28%	8.75%	11.75%	11.99%
13	52	37.67%	34.01%	9.48%	12.32%	12.92%

CONCLUSION

- This approach provides a robust statistical method for adapting the literature estimates as per the requirements of an economic model
- Due to the wide range of remission estimates in the literature face validation via expert clinical opinion is recommended to determine appropriate model inputs

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CONFLICT OF INTEREST

GP, SG, SB, AH and MMB are employees of Novartis. DMcB and JG are employees of RTI Health Solutions. AM has received research support/ consultancies/ meeting assistance from Novartis, UCB Pharma and GSK

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