

Exploring the Healthcare Resource Utilisation (HCRU) Associated with Chorea in Patients with Huntington's Disease (HD): A Systematic Literature Review (SLR)

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Introduction

- HD is a rare autosomal dominant, neurodegenerative disorder caused by a CAG expansion in the *HTT* gene, resulting in the expression of mutant huntingtin protein^{1,2}. The disease is characterised by motor, psychiatric, and cognitive symptoms³. Disease progression with associated symptoms leads to complete caregiver dependency and death³.
- Chorea is an involuntarily hyperkinetic movement disorder and is the hallmark motor manifestation in HD³. Chorea occurs in >90% of patients over the course of the disease². Currently, the only approved therapies for the treatment of chorea are VMAT2 inhibitors, and include tetrabenazine, deutetabenazine, and valbenazine³. Antipsychotic drugs are used as “off-label” treatment alternatives³.
- Chorea disrupts patients' ability to complete daily activities, requires hospitalisations due to falls, and can affect employment⁴. Therefore, this study aimed to investigate the HCRU of chorea in HD.

Methods and Searches

- A broad SLR was conducted in Embase and PubMed on 7th February 2025 to identify the economic burden associated with HD.
- Eligible studies were full-text papers published 2008-2025 and conference proceedings published 2020-2025 presenting data on HCRU or disease-related direct/indirect costs.
- This sub-analysis focused on studies presenting data specific to the economic burden of chorea in HD.
- Studies were screened by two reviewers and reconciled by a third. Data was extracted by a single reviewer, with data number-checked by a second reviewer.

Embase and PubMed hits: 472

Included economic studies: 91

HCRU of chorea in HD studies: 9

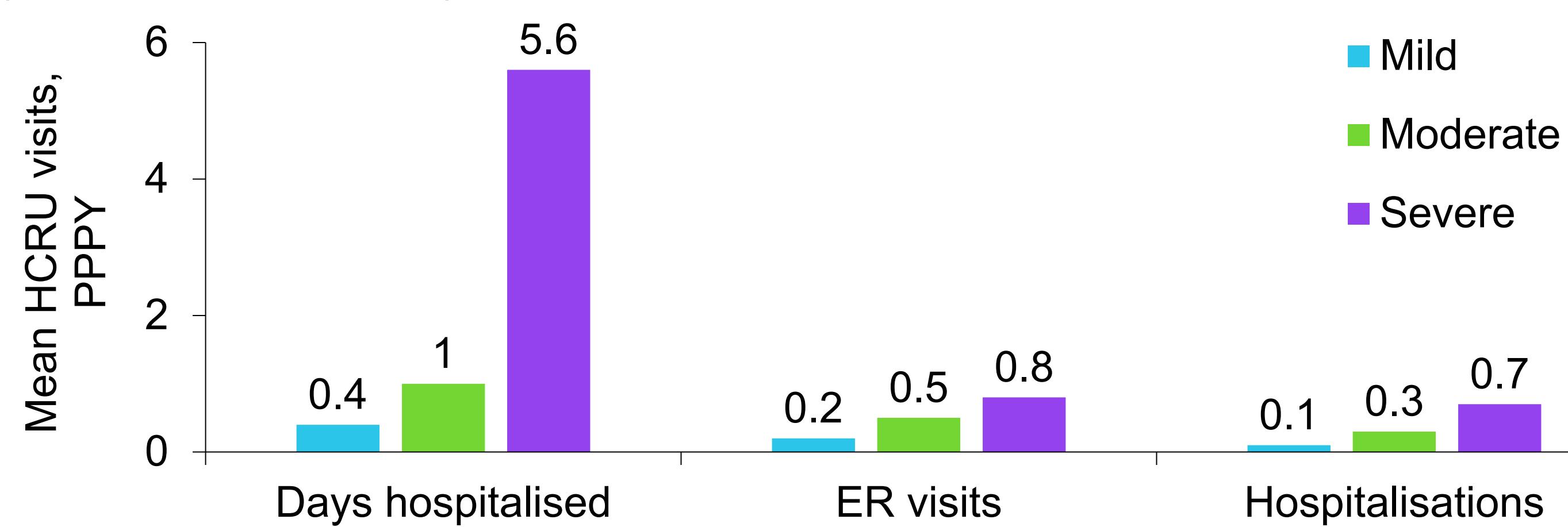
Results

The SLR yielded 9 studies on the HCRU associated with chorea in HD.

Impact of chorea and chorea severity on HCRU

- Patients with chorea vs. without had increased annual HCRU, including neurologist visits (3.4 vs. 2.3), and specialist centre visits (36% vs. 22%)⁴.
- HCRU increased with chorea severity. Severe chorea was associated with more annual mean emergency room visits, hospitalisations, and days hospitalised than patients with moderate or mild chorea (Figure 1)⁵.

Figure 1: Mean number of annual HCRU by chorea severity in patients with HD (n=512, US, 2016-2017)⁵



Cost and HCRU of chorea treatment

- In the US, VMAT2 inhibitors, antipsychotic medications, benzodiazepines are used to treat chorea in patients with HD^{6,7}. Risperidone was the most prescribed drug (26%), followed by tetrabenazine (17%), other (6%), risperidone + tetrabenazine (6%), and deutetabenazine (2%)⁷.
- Deutetabenazine was mainly prescribed by neurologists (83%, n=57), while valbenazine was mainly prescribed by psychiatrists (50%, n=73)⁸.
- VMAT2 inhibitors are significantly more expensive than risperidone, with valbenazine being the most expensive VMAT2 inhibitor (Table 1).

Table 1: Annual drug costs for the treatment of chorea per patient with HD (USD)

Drug	Annual Drug Cost (\$)
Tetrabenazine	24,996 ⁹ (median) - over 70,000 ¹⁰ (mean)
Deutetabenazine (median)	69,972 ⁹
Valbenazine (median)	76,908 ⁹
Risperidone (mean)	7,848 ¹⁰

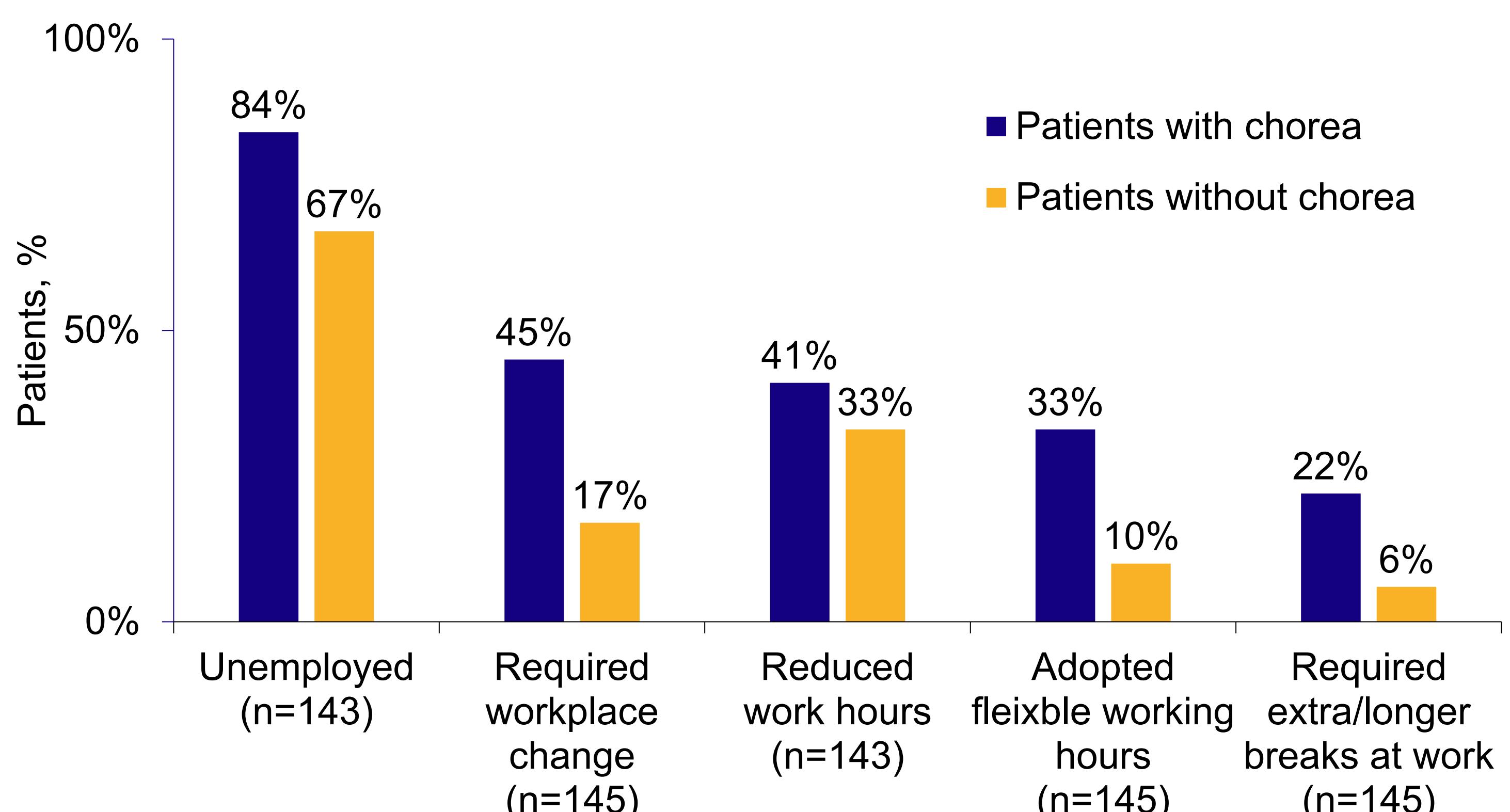
Note: Killoran 2012 did not report adjusted cost year¹⁰ and Reynolds 2023 reported costs adjusted to 2019⁹

- A Russian pharmacoeconomic analysis reported that in comparison to neuroleptics, tetrabenazine was effective and economically justified for the treatment of chorea in patients with HD (conducted in 2020)¹¹.

Effect of chorea on employment

- Patients with chorea vs. without had greater functional impairment across all domains, such as employment, change of workplace, change in work hours, and requirements for extra breaks at work (Figure 2)⁴.

Figure 2: Impact of chorea on employment in patients with HD (US, 2017)⁴



Impact of chorea severity on employment and work activity

- As the severity of chorea increased, unemployment rate increased, more patients stopped working due to their health, and work impairment increased in employed patients with HD (Table 2)¹².

Table 2: Employment and work productivity by chorea severity in patients with HD (n=10,903, Global, 2013-2020)¹²

	TMC 0-7	TMC 8-14	TMC 15-21	TMC 22-28
Unemployed	71.4%	80.2%	92.3%	96.3%
Stopped working due to their health ^a	20.9%	28.4%	28.3%	80.0%
Work missed because of HD	9.3%	13.5%	17.2%	73.0%
Impairment while working due to HD	18.3%	24.0%	27.9%	45.0%
Overall work impairment due to HD	20.2%	26.1%	31.1%	85.5%
Activity impairment due to HD	34.5%	41.4%	55.4%	66.1%

Note: Chorea severity categorised based on Unified Huntington's Disease Rating Scale® TMC scores grouped into evenly divided ranges (0-7, 8-14, 15-21, 22-28) for analysis (0 = no chorea, 28 = most severe). ^aWhether the patient stopped or reduced work because of their health.

Conclusions

- Chorea imposes a substantial HCRU burden on patients with HD, which increases with chorea severity.
- Chorea can negatively impact the ability for patients to continue working and impairs day-to-day activities. Patients with increasing severity of chorea require more healthcare resources and experience greater impairments in work/daily functioning.
- Despite VMAT2 inhibitors being the only approved treatments for chorea in HD, their use remains limited—potentially due to high costs.
- Reducing barriers to access may help mitigate the HCRU associated with chorea in HD and help improve day-to-day functioning and work productivity, enabling patients to remain employed.

References

1. Scahill, R., et al. (2020). *Lancet Neurol* 19(6):502-512.
2. Vadlamani, N., et al. (2024). *Cureus*, 16(10).
3. Stimming, E.F., et al. (2025). *Neurology and Therapy*, pp.1-14.
4. Claassen, D.O., et al. (2021). *Journal of Health Economics and Outcomes Research*, 8(1), p.99.
5. Claassen, D.O., et al. (2018). *Journal of Huntington's Disease*, 7(4), pp.345-353.
6. Dellefield, M.E. and Ferrini, R. (2011). *Journal of Neuroscience Nursing*, 43(4), pp.186-192.
7. Bardakjian, T.M., et al. (2019). *Journal of Huntington's disease*, 8(4), pp.501-507.
8. Ma, E., et al. (2024). *Neurology* (Vol. 102, No. 17_supplement_1, p. 4011).
9. Reynolds, E. et al., (2023). *Neurology* 100(9):884-898
10. Killoran, A and Biglan, K. (2012). *Curr Treat Opt Neurol* 14:137-149
11. Krysanova, V., et al. (2020). *Value in Health*, 23, p.S697.
12. Reshef, S., et al. (2023). *Value in Health*, 26(6), p.S128.

Abbreviations: ER: emergency room; HCRU: healthcare resource utilisation; HD: Huntington's disease; PPPY: per patient per year; TMC: Total Maximal Chorea; US: United States; VMAT2: vesicular monoamine transporter 2

