Healthcare utilization and costs among US Medicaid beneficiaries with Huntington's disease

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What does this study mean for the Huntington's disease (HD) community?

People with HD use significantly more healthcare resources than those without the disease and incur higher healthcare costs, which increase as HD progresses. Development of an effective disease-modifying therapy may help reduce the use of healthcare resources associated with the disease.

Objective

To compare healthcare utilization (HCU) and costs between people with Huntington's disease (HD) and non-HD controls in the US Medicaid database.

Conclusions

- Medicaid beneficiaries with Huntington's disease (HD) have higher healthcare utilization (HCU) and healthcare costs compared with beneficiaries without HD.
- All-cause and HD-related HCU and costs increased with disease progression, with HD beneficiaries at later stages having more burden.

BACKGROUND

- Huntington's disease (HD) is a genetic, neurodegenerative disease that typically manifests between the ages of 30 and 50 years.[1,2]
- HD is associated with a high burden of disease, reduced quality of life and high healthcare costs.[3–7]
- Little is known about the burden of illness among US Medicaid beneficiaries with HD.

METHODS

- This was a retrospective cohort study using data from the 2010–2014 Medicaid Analytic eXtract files for 17 US states (CA, GA, IA, ID, LA, MI, MN, MS, MO, NJ, PA, SD, TN, UT, VT, WV and WY).
  - At the time of the study, complete data was only available for 17 states.

Inclusion criteria and matching controls to HD cases

- Non-dual-eligible Medicaid beneficiaries with HD, defined as having ≥1 medical claim with an HD diagnosis (ICD-9-CM: 333.4) between 01/01/11 and 12/31/13 were included (diagnosis date=index; we randomly assigned index for patients with multiple HD diagnosis claims).
- Beneficiaries without HD (non-HD controls) were identified using a 100% sample of Medicaid beneficiaries and matched 3:1 (by age, sex, US state, index year) to individuals with HD.
- All individuals had continuous enrollment in Medicaid fee-for-service for 1 year pre- and post-index. Baseline characteristics, 1-year all-cause and HD-related HCU and costs (2014 USD) were compared using chi-square and t-tests.
  - HD-related HCU was defined as any utilization related to HD diagnosis or symptoms associated with HD.
- Beneficiaries with HD were classified as having early-, middle- or late-stage disease using an algorithm for a hierarchical assessment of disease severity markers present in claims.[7]
  - HCU and costs in this group were then stratified by disease stage.

RESULTS

Study demographics

Figure 1. Study demographics and baseline characteristics

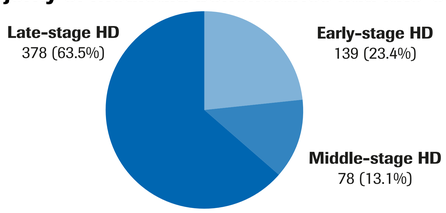
2,380 Medicaid beneficiaries in total
Mean age (SD): **46.8 (14.4)**
Female: **63.7%**

595 beneficiaries with HD | **1,785 non-HD controls**

3.7 (1.9)	Mean (SD) number of chronic conditions*	**3.1 (2.4)**
0.9 (1.5)	Mean (SD) Charlson comorbidity index*	**1.3 (2.0)**
	Prevalence of HD symptoms/comorbidities at baseline, n (%)	
103 (17.3)	Anxiety	**303 (17.0)**
482 (81.0)	Chorea*	**–†**
119 (20.0)	Dementia*	**47 (2.6)**
57 (9.6)	Depression	**166 (9.3)**
118 (19.8)	Dysphagia*	**68 (3.8)**
522 (87.7)	Total*‡	**487 (27.3)**

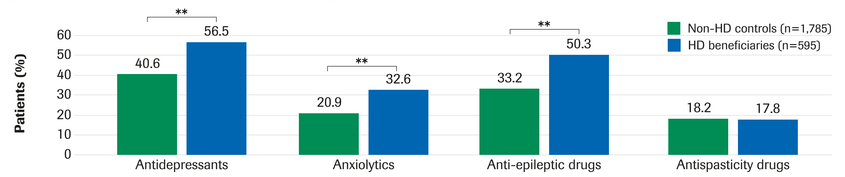
* p<0.001. † Reported per CMS cell size suppression policy (<11). ‡ Total includes patients with anxiety, chorea, cachexia, dementia, depression, or dysphagia.

The majority of Medicaid beneficiaries had late-stage HD



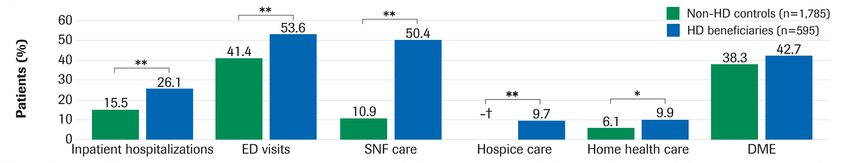
Beneficiaries with HD had higher annual HCU compared with non-HD controls

Figure 2. Annual prescription drug use between HD beneficiaries and non-HD controls



** p<0.001.

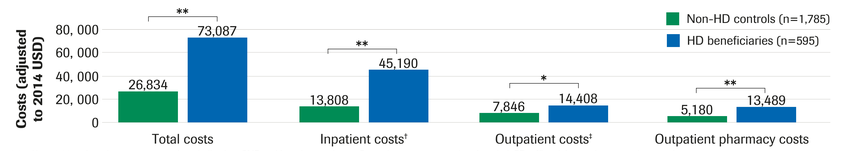
Figure 3. Annual all-cause HCU between HD beneficiaries and non-HD controls



* p<0.01. ** p<0.001. Mean (SD) number of office visits was similar between HD beneficiaries (7.8 [21.9]) and non-HD controls (8.7 [19.7], p=0.338). † Reported per CMS cell size suppression policy (<11).

Beneficiaries with HD had higher mean healthcare costs compared with non-HD controls

Figure 4. Annual all-cause healthcare costs (adjusted to 2014 USD) between HD beneficiaries and non-HD controls



* p<0.01. ** p<0.001. † Inpatient costs: acute hospitalization, SNF, and hospice services. ‡ Outpatient costs: outpatient hospital, ED, office, lab, or other outpatient services.

All-cause and HD-related HCU and costs were highest in beneficiaries with late-stage HD (see Supplementary Materials)

Acknowledgments

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Abbreviations

CMS, Centers for Medicare and Medicaid Services; DME, durable medical equipment; ED, emergency department; HCU, healthcare utilization; HD, Huntington's disease; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; SD, standard deviation; SNF, skilled nursing facility; USD, US dollars.

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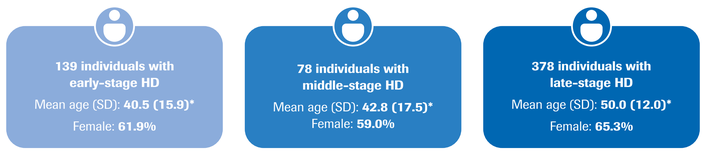
Supplementary Materials

Supplementary Figure 1. Study demographics for HD beneficiaries

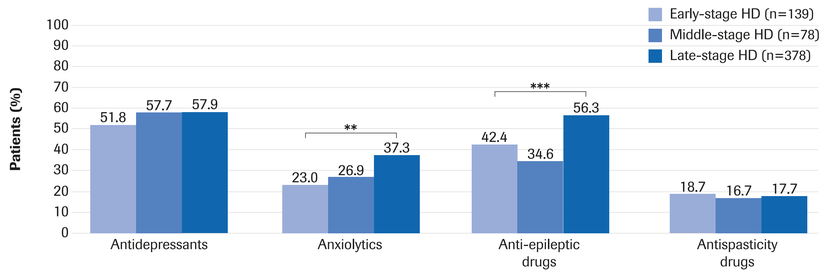


	Early-stage HD (n=139)	Middle-stage HD (n=78)	Late-stage HD (n=378)
Mean (SD) chronic conditions*	3.0 (1.8)	3.8 (2.0)	3.9 (1.9)
Mean (SD) Charlson comorbidity index	0.7 (1.4)	1.0 (1.5)	1.0 (1.5)
Prevalence of HD symptoms/comorbidities at baseline, n (%)			
Anxiety	31 (22.3)	13 (16.7)	59 (15.6)
Chorea*	89 (64.0)	52 (66.7)	341 (90.2)
Dementia*	-†	-†	106 (28.0)
Depression	14 (10.1)	13 (16.7)	30 (7.9)
Dysphagia*	-†	-†	106 (28.0)
Total*‡	101 (72.7)	60 (76.9)	361 (95.5)

* p<0.001. † Reported per CMS cell size suppression policy (count <11). ‡ Total includes patients with anxiety, chorea, cachexia, dementia, depression, or dysphagia.

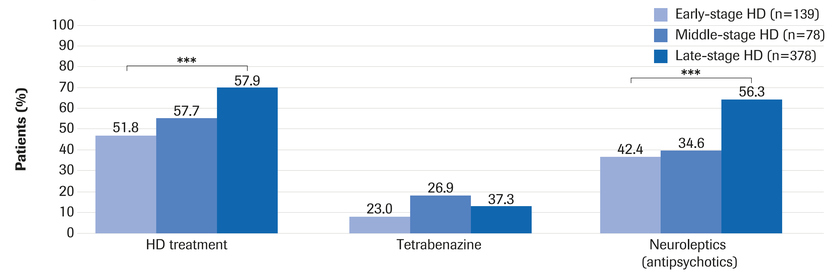
All-cause and HD-related[a] HCU were highest in Medicaid beneficiaries with middle- and late-stage HD

Supplementary Figure 2. Annual prescription drug use, stratified by HD stage



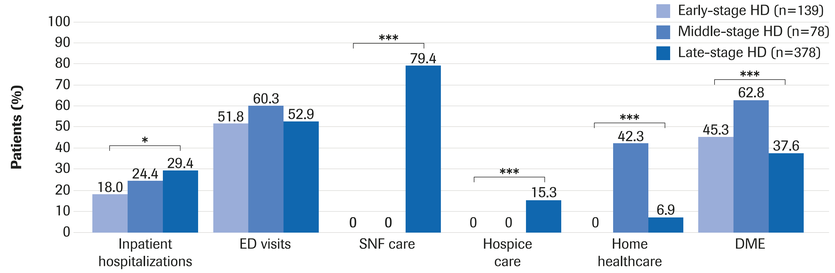
** p<0.01. *** p<0.001.

Supplementary Figure 3. Annual HD-related prescription drug use, stratified by HD stage

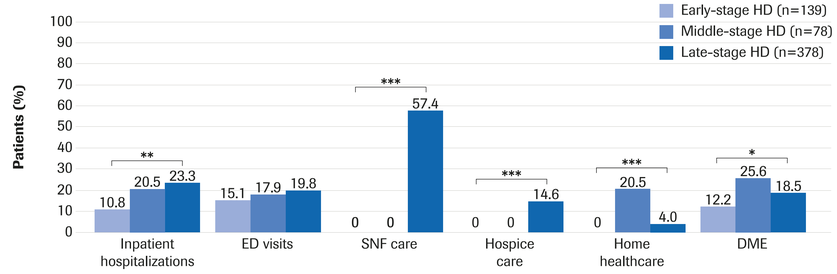


*** p<0.001. HD treatments include the following: tetrabenazine, deutetrabenazine, glutamatergic-modifying drugs, donepezil, minocycline, nabilone, coenzyme Q10, neuroleptics, energy metabolites.

Supplementary Figure 4. Annual all-cause HCU, stratified by HD stage



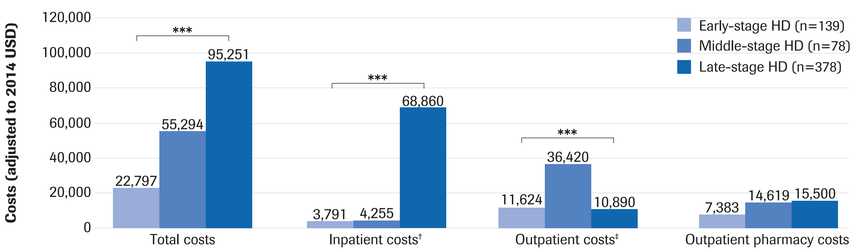
Supplementary Figure 5. Annual mean HD-related HCU, stratified by HD stage



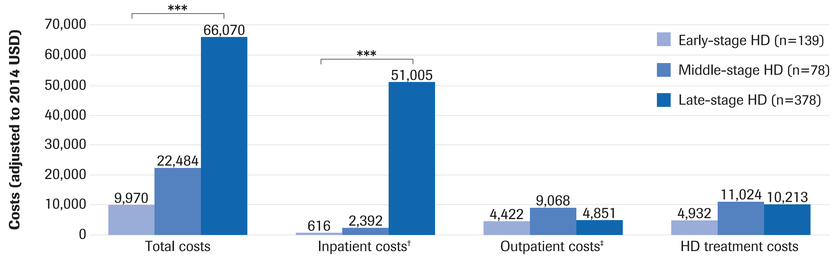
* p<0.05. ** p<0.01. *** p<0.001. † Reported per CMS cell size suppression policy (<11). Mean (SD) number all-cause office visits mean (SD) number of office visits differed between early-stage (9.5 [24.2]), middle-stage (19.9 [38.7]) and late-stage HD beneficiaries (4.6 [13.9]), and mean (SD) number of HD-related office visits differed between early-stage (1.7 [2.9]), middle-stage (3.4 [5.7]) and late-stage HD beneficiaries (1.3 [6.9])*.
[a] HD-related HCU was defined as any utilization related to HD diagnosis or symptoms associated with HD.

HD-related healthcare costs were highest in Medicaid beneficiaries with late-stage HD, particularly inpatient costs

Supplementary Figure 6. Annual mean all-cause healthcare costs (adjusted to 2014 USD) stratified by disease stage



Supplementary Figure 7. Annual mean HD-related healthcare costs (adjusted to 2014 USD) stratified by disease stage



*** p<0.001. † Inpatient costs: acute hospitalization, SNF, and hospice services. ‡ Outpatient costs: outpatient hospital, ED, office, lab, or other outpatient services.

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