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BRIEF COMMUNICATION

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Early Adoption of Dupilumab in the Medicare Population in 2017

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Background: In March of 2017, dupilumab became the first FDA approved injectable biologic for treatment of moderate-to-severe atopic dermatitis (AD). As the first drug in this class for AD, dupilumab has revolutionized the disease's treatment and improved patient outcomes significantly. Previous work has demonstrated that dermatologic injectable biologics are not uniformly accessible to patients in the US, and that patients in more rural regions are less likely to have access to these medications. In this study, we aimed to evaluate the early utilization trends of dupilumab for the Medicare population in the first year of its FDA approval (2017). **Methods**: Retrospective cohort study of the Medicare Provider Utilization and Payment Data. Counties were categorized by Rural-Urban Continuum Codes (RUCC) based on size, extent of urbanization, and proximity to a metropolitan (metro) area as defined by the National Center for Health Statistics Urban-Rural Classification Scheme for Counties. **Results**: There were 142 individuals who prescribed dupilumab at least 10 times in 2017, 80% of whom were dermatologists. Of these providers, 130 (91.5%) practiced in metropolitan (metro) counties and 12 practiced in non-metro counties. There were 14 cities with two or more dupilumab prescribers, with highest numbers observed in New York, NY (8 providers); Philadelphia, PA (6 providers); Phoenix, AZ (5 providers); and Norfolk, VA (4 providers). **Conclusions**: There are differences in access to dupilumab in the Medicare population based on geographic location in the US. Trends of decreased access to novel dermatologic biologics in rural areas of the US may begin at their introduction to the market, identifying a potential target for future interventions to equalize access.

Dupilumab is a monoclonal antibody that blocks the α subunit of the interleukin (IL)-4 receptor. Blocking this receptor subunit inhibits the action of both IL-4 and IL-13, thereby reducing T_H2 activity. Dupilumab became the first FDA approved injectable biologic for moderate-to-severe atopic dermatitis (AD) in March of 2017. As a highly effective and safe treatment, it has represented a paradigm shift for the care of moderate-to-severe AD [1]. Previous work suggests that there are a number of factors that may influence the early adoption of new medications such as dupilumab [2]. Additional research has shown that both access to injectable biologics in dermatology and utilization of medical resources for AD vary significantly across the US [3-5].

Using the publicly available Centers for Medicare and Medicaid Services (CMS) Medicare Provider

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Abbreviations: AD, atopic dermatitis; CMS, Centers for Medicare and Medicaid Services; RUCC, Rural-Urban Continuum Codes.

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Table 1. Specialty and overall utilization of prescribing providers.

Specialty	Number of Providers – n (%)	Mean Claims / Provider	Minimum Claims / Provider	Maximum Claims / Provider
All	142	17.2	11	82
Dermatology	112 (78.9%)	18.0	11	82
Allergy/Immunology	14 (9.9%)	13.9	11	22
Physician Assistant	11 (7.8%)	15.2	11	32
Nurse Practitioner	2 (1.4%)	19	14	24
Resident	2 (1.4%)	11.5	11	12
Internal Medicine	1 (0.7%)	12	-	-

Utilization and Payment Data: Part D, this study evaluates all providers who prescribed dupilumab at least 10 times to Medicare beneficiaries in the first year of its FDA approval (2017) to describe early utilization patterns of dupilumab and to characterize the introduction of new and revolutionary dermatologic therapies in the Medicare population [6]. Counties were assigned a Rural-Urban Continuum Code (RUCC) based on the National Center for Health Statistics Urban-Rural Classification Scheme for Counties [7]. This scheme is based on size, extent of urbanization, and proximity to a metropolitan (metro) area. Counties were categorized into metro (RUCC 1-3) and non-metro (RUCC 4-9) counties.

Of the 142 individuals who prescribed dupilumab at least 10 times in 2017, nearly 80% were dermatologists (Table 1). Allergy/immunology specialists comprised approximately 10% of these prescribers. Dermatologists submitted a mean of 18 claims/provider, with a maximum claim number of 82 while allergy/immunology specialists submitted a mean of 13.9 claims/provider with a maximum claim number of 22. Advanced practitioners comprised approximately 10% of prescribers in this study. Based on the CMS Medicare Provider Utilization and Payment Data: Part B dataset, among these 13 advanced practice providers, five practiced at offices with a dermatologist, two at offices with other physicians, and three at offices where there were no additional providers submitting claims to Medicare Part B; the remaining three advanced practitioners did not submit claims to Medicare Part B and could therefore not be matched to physician providers based on address as this information is not available in the Part D dataset [8].

Geographically, the distribution of individuals prescribing dupilumab at least 10 times in 2017 was largely concentrated in large urban centers. Based on RUCC classifications [7], 130 of these providers (91.5%) practiced in metro counties (RUCC 1-3) and 12 of these providers practiced in non-metro counties (RUCC 4-9). With respect to individual cities, 14 cities had two or more such dupilumab prescribers, and the highest numbers were observed in New York, NY (8 providers); Philadelphia, PA (6 providers); Phoenix, AZ (5 providers); and Norfolk, VA (4 providers).

These data on prescribing trends from dupilumab's first year of FDA approval for treatment of AD reveal several important early trends in the drug's utilization. Firstly, the primary use of the drug was by dermatologists, advanced practitioners in dermatology practices, and allergists. With previous work demonstrating differences in practice patterns for AD by provider specialty, utilization patterns by provider specialty should continue to be analyzed in the future [9]. Additionally, the majority of prescribers in our study were concentrated in metro areas and very few areas had more than three prescribers. These observations suggest that early adopters of new treatments are generally clustered in larger metro areas and that geographic differences may emerge at the time of introduction of new medications [3]. As dupilumab has now been approved for several years, it is important to continue to observe trends in its use and availability over time.

Our study had several limitations. First, due to our data source, our analysis was limited to the Medicare population and we were unable to evaluate the prescription trends of dupilumab for patients with commercial insurance or Medicare Advantage plans. Our study population is likely not the most frequent users of dupilumab, so it would be of interest to study the use of the drug for younger patients with commercial insurance. Furthermore, given that prescribing numbers were generally low in our sample and that providers are included in the data source only if they prescribed the medication at least 10 times, it is likely that there were a number of providers prescribing dupilumab who were not captured in our analysis.

In conclusion, in the year of FDA approval of dupilumab — the first injectable biologic for AD — its use within the Medicare population was concentrated predominantly in large metro regions. These data suggest that the trends of decreased access to novel dermatologic biologics in rural areas of the US may begin at their introduction to the market, identifying a

potential target for future interventions aimed at reducing such differences in access to care. This also suggests that there are differences in access to a revolutionary therapy for AD in the Medicare population based on geographic location in the US.

REFERENCES

1. Gooderham MJ, Hong HC, Eshtiaghi P, Papp KA. Dupilumab: A review of its use in the treatment of atopic dermatitis. J Am Acad Dermatol. 2018 Mar;78(3 Suppl 1):S28–36.
2. Garjón FJ, Azparren A, Vergara I, Azaola B, Loayssa JR. Adoption of new drugs by physicians: a survival analysis. BMC Health Serv Res. 2012 Mar;12(1):56.
3. Feng H, Cohen JM, Neimann AL. Access to injectable biologic medications by medicare beneficiaries: geographic distribution of US dermatologist prescribers. J Dermatolog Treat. 2019 May;30(3):237–9.
4. Nguyen KB, Read C, Wu KK, Armstrong AW. Where you live matters: regional differences in health care resource use for psoriasis in the United States. J Am Acad Dermatol. 2019: https://doi.org/10.1016/j.jaad.2019.10.014.
5. Wu KK, Nguyen KB, Sandhu JK, Armstrong AW. Does location matter? Geographic variations in healthcare resource use for atopic dermatitis in the United States. J Dermatolog Treat. 2019 Sep:1–7.
6. Centers for Medicare and Medicaid Services. Medicare Provider Utilization and Payment Data: Part D Prescriber 2020 [cited 2020 February 3]. Available from: https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Medicare-Provider-Charge-Data/Part-D-Prescriber
7. Ingram DD, Franco SJ. 2013 NCHS Urban-Rural Classification Scheme for Counties. Vital Health Stat 2. 2014 Apr;(166):1–73.
8. Centers for Medicare and Medicaid Services. Medicare Provider Utilization and Payment Data: Physician and Other Supplier 2019 [cited 2019 November 19]. Available from: https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Medicare-Provider-Charge-Data/Physician-and-Other-Supplier
9. Saavedra JM, Boguniewicz M, Chamlin S, Lake A, Nedorost S, Czerkies LA, et al. Patterns of clinical management of atopic dermatitis in infants and toddlers: a survey of three physician specialties in the United States. J Pediatr. 2013 Dec;163(6):1747–53.