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Tracking the Impact of COVID-19 on the Retina Community

COVID-19 has had a cataclysmic effect on America and much of the world. The health care system in general has sustained devastating collateral damage as many practices were shuttered, surgery centers devoid of cases, and hospitals empty save for patients infected with the virus.

To try to understand the pandemic’s impact, surveys have been distributed to physicians, most notably the ASRS COVID-19 Survey Series (available at www.asrs.org/covid-19-survey-series).



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Retinomics invited David Williams, MD, MBA, co-founder of Vestrum Health, to present a retina-specific data analysis to help gain a deeper perspective on the pandemic’s effect on retina practices. Vestrum has amassed a database of information directly from the electronic health record (EHR) systems of hundreds of practicing retina specialists.

From 41 patients to a pandemic

On December 31, 2019, Chinese health officials informed the World Health Organization (WHO) about a cluster of 41 patients with a mysterious pneumonia, apparently connected with a seafood market in Wuhan, China. By early March, cases of COVID-19 were reported on every continent in the world except Antarctica, and on March 11, the WHO declared the outbreak a pandemic.

Prior to March 8, there had been only a few hundred cases of COVID-19 reported in the United States, and medical practices—including retina practices—were operating mostly as usual, albeit with a heightened sense of awareness and infection transmission precautions.

However, by the second week of March, as the severity and public health implications of the pandemic became obvious, the imperative to establish much stronger infection mitigation steps in outpatient health care facilities became apparent. Retina practices throughout the nation began to implement strategies to protect patients, staff, and doctors through enhanced sanitation, office decongestion, and social distancing.

The Vestrum Health database has closely tracked and documented the impact of COVID-19 on the retina community throughout the pandemic. Vestrum Health maintains a robust, continuously updated, aggregated database of deidentified Health Insurance Portability and Accountability

Act (HIPAA)-compliant data, automatically captured directly from the electronic health records of several hundred geographically and demographically representative retina specialists throughout the United States.

Patient volume trends

Figure 1 illustrates the relative percentage change in total patient volume seen by Vestrum Health retina specialists from the week ending January 11 to the week ending May 16. (Note that the Vestrum Health database is refreshed each Tuesday.) The weekly average from January 11 through May 17, 2019 was used as the index to calculate change in each week.

The 2020 data indicates that total patient volume was level for the weeks ending January 11 to March 14—the *pre-COVID* period. However, the third week of March—the beginning of what we’ll call the *COVID* period—was characterized by an abrupt drop in total patient volume of approximately 38%.

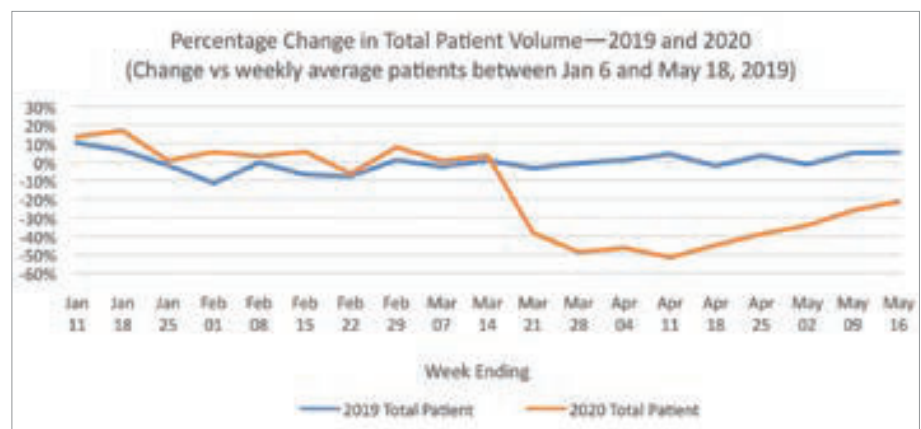


Figure 1. Source: Vestrum Health, LLC. Used with permission.

Patient volumes continued to drop in the subsequent 4 weeks to a nadir of approximately 50% of pre-COVID levels, with a slow recovery by May 16 to a volume approximately 20% lower than the pre-COVID time.

Analysis of returning vs new patient volume (Figures 2-4) shows a dichotomy.

While returning-patient visits dropped to a nadir of approximately 50% of pre-COVID volume, new-patient visits dropped as much as 70%. The trajectory of recovery has also been different for returning vs new patients, with returning-patient volume recovering to 80% of the pre-COVID level by May 16, while new-patient volume has remained lower for longer, recovering to only 50% of pre-COVID levels by May 16.

There are a couple of potential explanations of the dichotomy between returning- vs new-patient volume during the COVID period. Patients undergoing regular anti-VEGF therapy comprise a significant proportion of the patient volume of contemporary retina practices. These patients are at risk of potentially severe vision loss if treatment is interrupted for too long.

Thus, patients requiring anti-VEGF-injections and their physicians are likely to have a stronger tendency to continue treatment through the pandemic than other categories of patients with less risk of acute vision loss. This is illustrated by Figure 5 on page 54, which shows a smaller drop in injection patient volume compared to non-injection patient volume.

New patient volume for a retina practice is highly dependent on referrals from comprehensive ophthalmology and optometry practices. The shutdown of “non-essential” medical services throughout the United States impacted comprehensive ophthalmology and optometry severely, causing them to curtail their operations much more than retina practices.

Many optometry practices shut down completely during COVID, while comprehensive ophthalmology practices were commonly restricted to servicing only “emergency” patients. As has been documented in many media reports, patients have also been hesitant to seek routine care—and in some cases, even emergency care—due to fears of COVID-19. The combination of the relative shutdown of primary eye care and patient hesitation to seek care may explain the more severe drop in new-patient volume vs return-patient volume for retina practices.

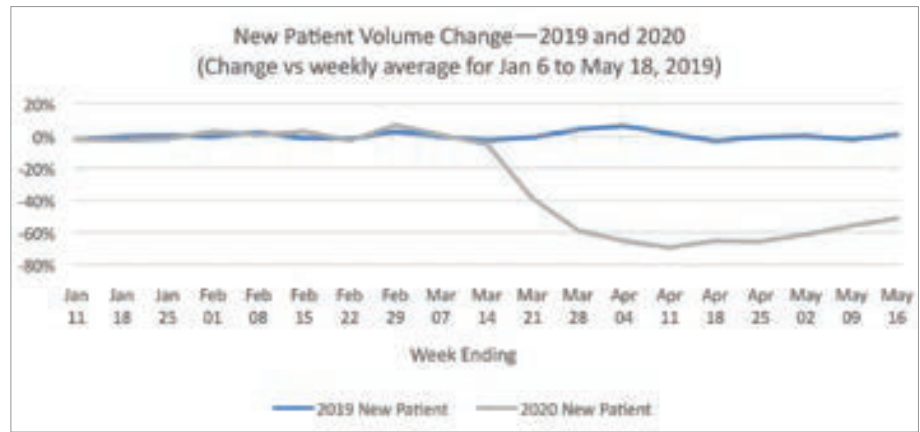


Figure 2. Source: Vestrum Health, LLC. Used with permission.

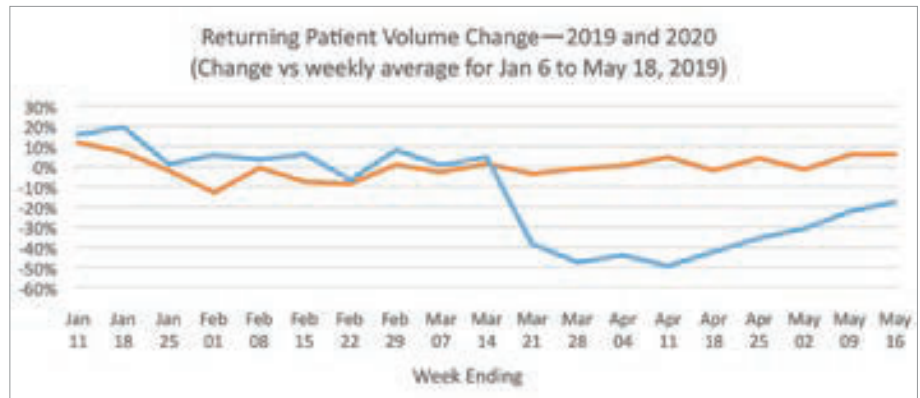


Figure 3. Source: Vestrum Health, LLC. Used with permission.

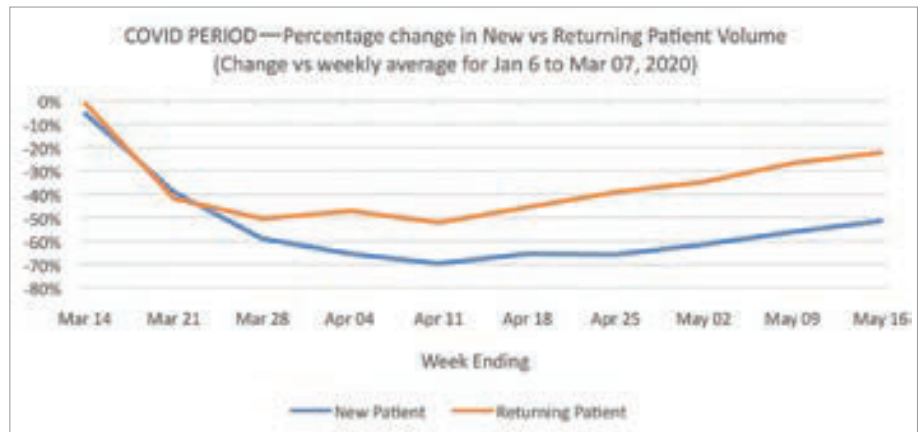


Figure 4. Source: Vestrum Health, LLC. Used with permission.

Disease volume trends

Age-related macular degeneration (AMD), diabetic retinopathy, retinal detachment, and vitreous hemorrhage comprise a large proportion of patient volume in retina practices, and each disease can, if left untreated, lead to severe vision loss. Figure 6 on page 54 shows the trends in new patients being seen for each of these conditions.

The Figure 6 data shows a severe drop in new-patient volume during the COVID period for

wet and dry AMD, diabetic macular edema (DME), diabetic retinopathy without DME, proliferative diabetic retinopathy, retinal detachment, and vitreous hemorrhage. We know that the incidence of these conditions in the population is unlikely to have changed from the pre-COVID to the COVID period, so many potentially blinding conditions are going undiagnosed and untreated.

The implications of delayed diagnosis and treatment of these conditions are grave, with a high probability of many patients suffering

irreversible vision loss. Retina specialists likely will begin seeing these patients and documenting the consequences of delayed attention in the coming months.

Dry-AMD patient trends

Figures 7 and 8 demonstrate the changes in new and returning intermediate dry-AMD patient volume.

New intermediate dry-AMD volume dropped precipitously in the early days of the pandemic, and remained low through May 16, paralleling the decline in overall new-patient volume. Since these patients are at higher risk of developing wet AMD, there is concern that delayed evaluation might result in worse visual outcomes going forward.

A significant question is whether this delay in referral of intermediate dry AMD might result in a higher incidence of wet AMD with worse presenting visual acuity in the future. Vestrum Health continues to monitor these trends.

Vision trends for wet AMD, DME

Given the widespread impact of the COVID-19 pandemic, patient referrals for evaluation may be delayed relative to the pre-COVID period, and any potential delay might adversely affect vision by the time of evaluation. Figures 9 and 10 illustrate the mean visual acuity of new patients with wet AMD and with DME from early January in both 2019 and 2020.

The data does not show a relative decline in the mean visual acuity of newly referred wet-AMD patients during the COVID period compared to the pre-COVID period in 2020 or compared to the same calendar period in 2019. This would suggest that patients who were identified with possible wet AMD during the COVID period were referred promptly for care before incremental vision loss developed.

However, with new cases of wet AMD down by 45% from the similar period in 2019, it is likely that those not seeking medical help, or not referred to a retina specialist during this period, will present with worse visual acuity and a poorer long-term prognosis.

In contrast, the mean visual acuity of patients newly referred with DME during the COVID period was lower than both the pre-COVID period in 2020 and during the same calendar period in 2019. The reasons for this disparity are unclear, but we speculate that COVID-19-related stresses and/or poor diabetes control might have contributed to worse presenting disease and vision in this subgroup of patients.

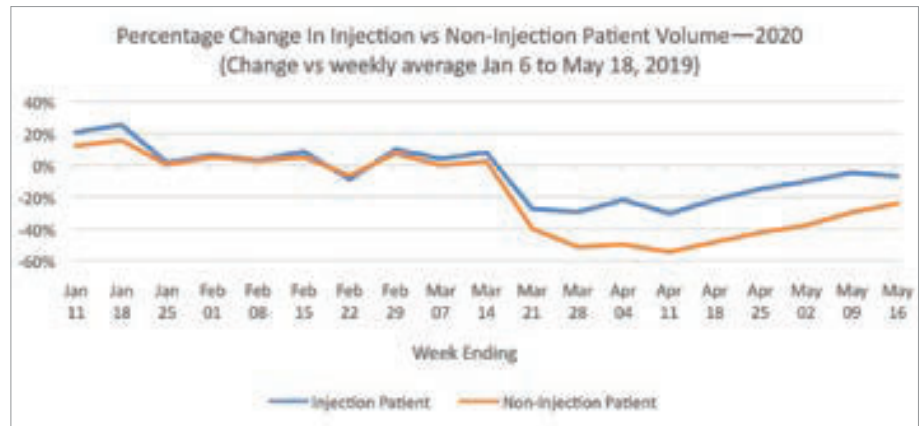


Figure 5. Source: Vestrum Health, LLC. Used with permission.

Percentage Changes in New Patients—2019 to 2020

	Jan-March	March-May
Total New Eyes	0%	-59%
New Wet AMD	-2%	-45%
New Dry AMD	-4%	-67%
New DME	2%	-56%
New DR without DME	7%	-59%
New PDR	2%	-49%
New RD	-12%	-45%
New VH	-4%	-36%

Figure 6. Source: Vestrum Health, LLC. Used with permission.

AMD = age-related macular degeneration; DME = diabetic macular edema; DR = diabetic retinopathy; PDR = proliferative diabetic retinopathy; RD = retinal detachment; VH = vitreous hemorrhage.

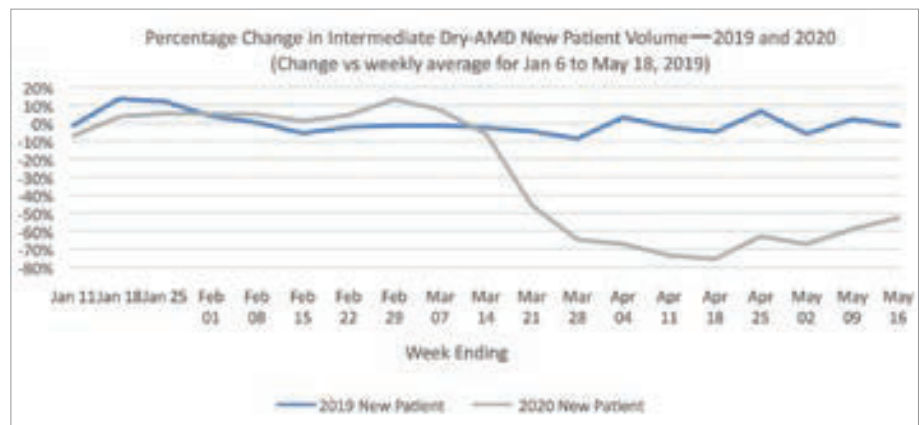


Figure 7. Source: Vestrum Health, LLC. Used with permission.

Returning-patient age trends

Vestrum Health data shows that the volume of returning older patients dropped relatively more than that of younger patients during the COVID period.

For wet AMD, the mean proportion of patients 90 years of age or older dropped from 22% to 18%, while the mean proportion for younger age groups increased or remained level. Similarly, for DME the proportion of patients aged 70 to 79 and 80 or older

decreased. This suggests that the older age group patients may have been relatively more hesitant to visit the retina specialist’s office than younger patients.

Regional patient volume changes

Figure 11 shows that the Northeast US region suffered a relatively greater drop in patient volume than all other regions of the country, quite likely due to the greater severity of the pandemic impact in the Northeastern region.

Conclusion

Vestrum Health data confirms and documents that the COVID-19 pandemic has had a significant adverse impact on retina practices and their patients. Patient volume suffered a severe decline that began in the early weeks of the national shutdown, with a relatively greater decline in new-patient referrals relative to return-patient visits.

The volume of both returning patients, and in particular new patients, with the potentially blinding conditions of wet AMD, diabetic retinopathy, retinal detachment, and vitreous hemorrhage, declined precipitously and has not returned to baseline pre-COVID levels as of May 31. This implies that the pandemic and the response to the pandemic may result in a significant prevalence of undiagnosed and untreated vision threatening conditions and consequently permanent unrecoverable vision loss for many patients.

The data suggests that presenting visual acuity in newly referred patients with DME during the COVID period has been worse than in pre-COVID times; this has implications regarding the physiological stress the pandemic may have on people with pre-existing disease and in particular for patients with delayed diagnosis and treatment.

The data also shows that patients over 80 years of age comprise a smaller proportion of COVID-times patient volume, compared to the pre-COVID period, and suggests that patients in this age group may be missing vision-sustaining care.

Finally, the data confirms the more severe impact of the pandemic on patient volumes in the northeastern United States, with that region comprising a smaller proportion of overall Vestrum Health-documented patient volume in the COVID period compared to the pre-COVID period, relative to other regions. 🌐

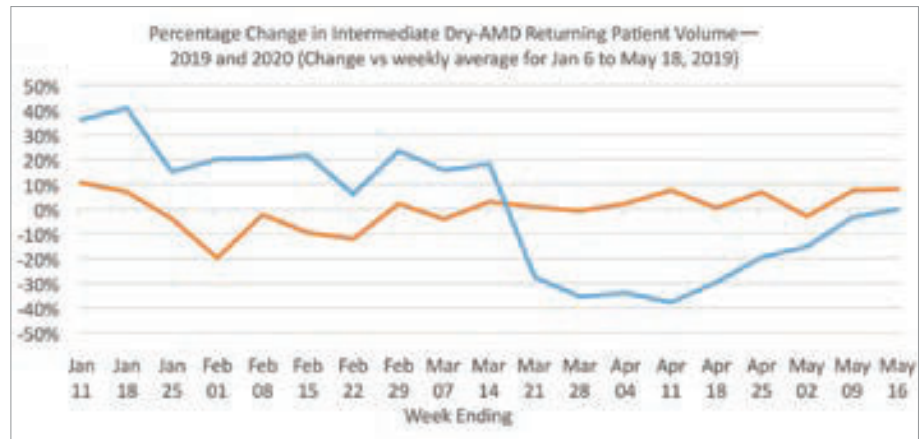


Figure 8. Source: Vestrum Health, LLC. Used with permission.

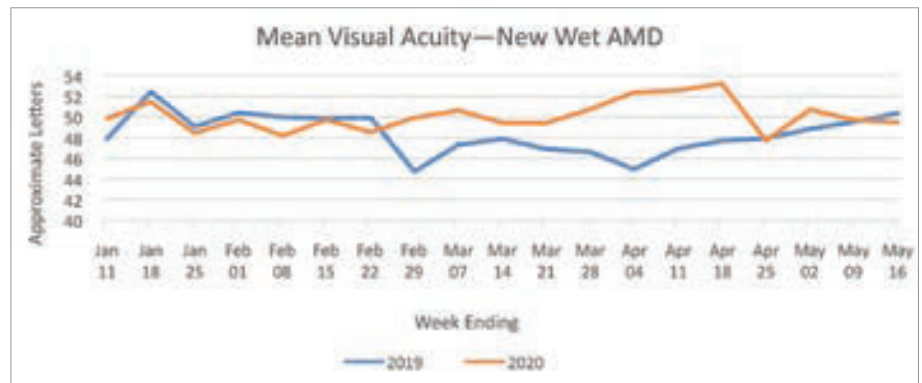


Figure 9. Source: Vestrum Health, LLC. Used with permission.

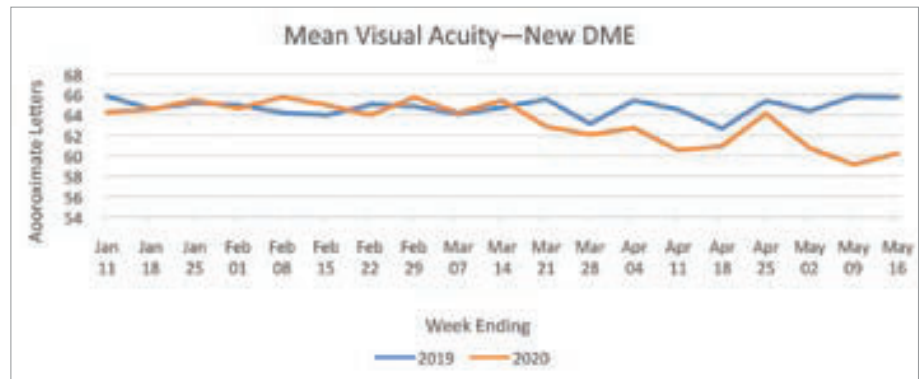


Figure 10. Source: Vestrum Health, LLC. Used with permission.

Mean patient distribution by region, 2019-2020

	2019	2020 Pre-COVID	2020 Post-COVID
Midwest	12%	11%	12%
Northeast	27%	26%	23%
Southeast	27%	28%	28%
Southwest	12%	13%	14%
West	22%	22%	23%

Figure 11. Source: Vestrum Health, LLC. Used with permission.

AMD = age-related macular degeneration; DME = diabetic macular edema; DR = diabetic retinopathy; PDR = proliferative diabetic retinopathy; RD = retinal detachment; VH = vitreous hemorrhage.

Financial Disclosures

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